X-cell

FURY 55

ASSEMBLY INSTRUCTIONS

miniature aircraft usa

STEP UP TO EXCELLENCE WITH X-CELL

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Kit Introduction

Thank you for purchasing the X-Cell Fury 55 by Miniature Aircraft USA. This model is the culmination of years of designing and manufacturing R/C helicopters. It is designed with the highest standards, and will provide years of enjoyment. Whether this is your first R/C model helicopter or you are an advanced R/C helicopter modeler, the X-Cell Fury 55 is a fantastic choice for a "50 size" model.

R/C Helicopter Safety

A radio controlled model helicopter is not a toy, but rather a technically complex device that must be built and operated with care. It is also a fascinating and challenging part of the R/C sport, the mastery of which is very rewarding. A model helicopter must be built exactly in accordance with the building instructions. The kit manufacturer has spent much time and effort refining his product to make it reliable in operation and easy to build. The essentially bolt together construction can proceed quite rapidly, giving the builder a strong sense of accomplishment that encourages hasty progress from one construction phase to the next, so that the completed model can be more quickly seen and enjoyed. It is essential to recognize and guard against this tendency. Follow building instructions exactly. Vibration and stress levels are high and all fasteners and attachments must be secure for safe operation.

Note that this is the first use of the word SAFETY in these comments. Previously the kit manufacturer's efforts to ensure reliable operation were mentioned. That is ALL that he can do. Safe operation is the responsibility of the builder/flyer and starts with careful construction and continues with selection and installation of reliable radio equipment and engine.

The need for safety is nowhere greater than at the flying field. A number of guidelines for safe flight have been developed by experienced flyers and are set down here. It is urged that they be read, understood and followed.

Warning! – Risk of death or serious injury

Remote Control ("R/C") Helicopters can be dangerous. Inexperienced pilots of R/C Helicopters should be trained and supervised by experienced operators. All operators should use safety glasses and other appropriate safety equipment, and exercise necessary precautions when fueling, repairing, maintaining, flying and storing R/C Helicopters, and when using or storing R/C Helicopter accessories, equipment, fuels, and related materials. R/C Helicopters should be used only in open areas free of obstacles, and far enough from people to minimize the possibility of injury from the helicopter or any of its components falling or flying in unexpected directions.

This helicopter is not a toy, but a complex flying machine that must be assembled with care by a responsible individual. Failure to exert care in assembly, or radio or accessory installation, may result in a model incapable of safe flight or ground operation. Rotating components are an ever present danger and source of injury to operators and spectators. Since the manufacturer and his agents have no control over the proper assembly and operation of his products, no responsibility or liability can be assumed for their use.

General Guidelines for Safe R/C Helicopter Flight

- Fly only at approved flying fields and obey field regulations.
- Follow frequency control procedures. Interference can be dangerous to all.
- Know your radio. Check all transmitter functions before each flight.
- Be aware that rotating blades are very dangerous and can cause serious injury.
- Never fly near or above spectators or other modelers.
- If you're a beginner, get help trimming the model first and flight training later.
- Don't "track" the main blades by holding the tail boom. This is a temptation to builders who cannot hover yet and is very dangerous.
- Follow all recommended maintenance procedures for model, radio and engine.

Academy of Model Aeronautics

Miniature Aircraft USA highly recommends joining the Academy of Model Aeronautics (AMA).

- AMA is the Academy of Model Aeronautics.
- AMA is the world's largest model aviation association, representing a membership of more than 150,000 from every walk of life, income level and age group.
- AMA is a self-supporting, non-profit organization whose purpose is to promote development of model aviation as a recognized sport and worthwhile recreation activity.
- AMA is an organization open to anyone interested in model aviation.
- AMA is the official national body for model aviation in the United States. AMA sanctions more than a thousand model competitions throughout the country each year, and certifies official model flying records on a national and international level.
- AMA is the organizer of the annual National Aeromodeling Championships, the world's largest model airplane competition.
- AMA is the chartering organization for more than 2,500 model airplane clubs across the country. AMA offers its chartered clubs official contest sanction, insurance, and assistance in getting and keeping flying sites.
- AMA is the voice of its membership, providing liaison with the Federal Aviation Administration, the Federal Communications Commission, and other government agencies through our national headquarters in Muncie, Indiana. AMA also works with local governments, zoning boards, and parks departments to promote the interests of local chartered clubs.
- AMA is an associate member of the National Aeronautic Association. Through NAA, AMA is recognized by the Fédération Aéronautique Internationale (FAI), the world governing body of all aviation activity, as the only organization which may direct U.S. participation in international aeromodeling activities.

For more detailed information, contact the Academy of Model Aeronautics
5161 E. Memorial Drive, Muncie, Indiana, 47302
or telephone (800) 435-9262.
You may also visit the AMA website at www.modelaircraft.org

Kit Assembly

Your Fury 55 kit will require a number of different supplies and tools to ensure the best final result. They are as follows:

Required Lubricants and Compounds:

1. Medium Strength Thread Locking Compound - X-Cell Super Lock Blue (MA3200-20)
2. Tri-Flow Oil (MA3200-02)
3. Tri-Flow Synthetic Grease (MA3200-06)
4. Medium Cyanoacrylate (CA)
5. Retaining Compound - X-Cell Super Lock Green (MA3200-22)

Required Tools:

1. m4 Nut Driver
2. m5 Nut Driver
3. m5.5 Nut Driver
4. m7 Nut Driver
5. 1.5mm Allen Driver
6. 2.0mm Allen Driver
7. 2.5mm Allen Driver
8. 3.0mm Allen Driver
9. Needle Nose Pliers
10. Phillips Screwdriver #1
11. Flat Screwdriver 2.5mm
12. Razor Knife (X-acto)
13. Snap Ring Pliers

Optional Tools:

1. Swashplate Leveling Tool (MA3000-10)
2. Pitch Gauge (MA3000-06)
3. Flybar Alignment Gauge (MA3000-08)
4. Crankshaft Locking Tool (MA3000-34)
5. Fury 55 Head Set Up Tool (MA3000-02)
6. Optical Heli Tachometer (MA3000-50)

Other required components:

The X-Cell Fury 55 is an airframe kit. To complete the model, several other items are required but are not included with the kit. There are many choices for these other required components, and any competent hobby retailer with R/C helicopter experience will be happy to make suggestions. You will need:

1. Engine, “50” size (there are various sizes available that are considered “50” size, all will work in the Fury 55.
2. Helicopter style muffler suited to the engine you choose.
3. Cyclic servos (Miniature Aircraft USA recommends high quality cyclic servos with no less than 80 oz. in. of torque).
4. Throttle servo (Miniature Aircraft USA recommends a high quality ball bearing servo)
5. Main rotor blades of 600-620mm in length.
6. R/C helicopter transmitter with at least 6 channels, and eCCPM capabilities.
7. R/C helicopter gyro (Miniature Aircraft USA recommends a “heading hold style gyro).
8. R/C helicopter starting and fueling equipment.
9. R/C helicopter engine governor (optional).

Important Assembly Tips - PLEASE READ

- Follow the instructions. The methods of construction documented in this manual have been proven to work. Do not rush the build of your model! You have purchased a world class model helicopter kit, take your time and realize that the final result is now up to you. Take the time to fully understand each step, if you are unsure please contact Miniature Aircraft USA.

- Follow the order of assembly. The instructions have been organized into major sections and have been written in such a way that each step builds upon the work done in the previous step. Changing the order of assembly may result in unnecessary steps.

- Clean all metal parts: All of the steel parts in this kit are coated with a lubricant to prevent them from rusting. This coating can interfere with the adhesives and thread locks needed for assembly. Use a solvent such as alcohol or acetone to clean the various metal parts, especially threads.

- Use thread lock as indicated. Generally, any bolt or screw that threads into a metal part requires thread lock. Model helicopters are subject to vibration and failing to use thread lock on any non-locking assembly may result in a part becoming loose or falling off.

Kit Contents

Please take some time to familiarize yourself with the contents of the kit. The Fury 55 kit has been broken down into six “bags”. Each bag contains parts and hardware. The hardware for each bag will be used only for that bag. There will be no left over parts after each bag is assembled.

Bag	Part No.	Part Description	Qty
1-A	128-10	C/F Right Main Frame .062”	1
1-A	128-13	C/F Left Main Frame .062”	1
1-A	128-16	G-10 Antirotation Guide .075”	1
1-A	128-17	C/F Left Servo Mount .125”	1
1-A	128-18	C/F Right Servo Mount .125”	1
1-A	128-19	C/F Gyro Plate .062”	1
1-A	128-34	C/F Radio Plate .062”	1
1-B	0586-16	Corner Block	2
1-B	128-40	Lower Mainshaft Block w/bearing	1
1-B	128-55	Upper Mainshaft Block w/bearing	1
1-B	128-57	Aluminum Tray Mounts	2
1-B	128-58	Frame Spacers	4
1-B	128-61	Rear Canopy Mounts	2
1-B	128-62	Front Canopy Mounts	2
1-B	128-65	Landing Gear Mounting Block	3
1-B	128-67	Pulley Mount	1
1-B	128-70	Aluminum Idler Pulleys - Assembled	2
1-B	128-80	Aluminum Boom Clamps	2
1-B	128-88	Rubber Fuel Tank Mounts	2
1-B	128-90	Tank Plate Threaded Stud Mounts	2
1-C	0875-1	Main Shaft Collar	1
1-C	128-43	Main Shaft	1
1-C	128-46	60T T/R Drive Pulley	1
1-C	128-47	600T T/R Drive Belt	1
1-C	128-49	Autorotation Hub	1
1-C	128-52	111T Main Gear	1
1-Hardware	0019	m3 Locknut	4
1-Hardware	0058-5	m5 x 8 Dog-Point Socket Set screw	1
1-Hardware	0058-6	m5 x 5 Socket set screw	1
1-Hardware	0059-1	m2.5 x 6 Socket Bolt	1
1-Hardware	0060-1	m3 x 6 Socket Bolt	44
1-Hardware	0061	m3 x 8 Socket Bolt	11
1-Hardware	0062-2	m3 x 12 Tapered Socket Head Bolt	4
1-Hardware	0064-3	m3 x 6 Button Head Socket Bolt	6
1-Hardware	0067	m3 x 14 Socket Bolt	4
2-A	0273	m6 x 10 x .011” Steel Shim Washer	1
2-A	0579-4	Brass Spacers	2
2-A	128-25	C/F Fan Shroud Plate .062”	1
2-A	128-82	Motor Mount Base	1
2-A	128-83	Motor Mounts	2
2-A	128-102	Aluminum Fan Hub	1
2-A	128-104	Aluminum Fan	1
2-A	128-106	Centrifugal Clutch	1
2-A	128-109	Start Shaft Assembly	1
2-A	128-110	Clutch Bell Unit	1
2-A	128-118	6mm Hex Starting Adaptor	1
2-A	128-120	Clutch Drive Bearing Block w/bearings	1

Bag	Part No.	Part Description	Qty
2-B	128-123	Fan Shroud Set	1
2-B	128-125	C/F Shroud Deflector .062”	1
2-B	128-128	1/2 x 3/8 x 1/16 Rubber O-Rings	2
2-B	128-22	C/F Rear Fan Shroud Mount .062”	1
2-B	128-28	C/F Left Front Frame Plate .062”	1
2-B	128-65	Landing Gear Mounting Block	1
2-C	115-65	Fuel Line-----16.5”	1
2-C	127-53	Plastic Struts	2
2-C	127-54A	Skid Plugs	4
2-C	128-66	Aluminum Skids	2
2-C	128-85	C/F Tank Mounting Plate	1
2-C	128-88	Rubber Fuel Tank Mounts	2
2-C	128-92	Rubber Fuel Tank Plug	1
2-C	128-94	Fuel Nipple	1
2-C	128-96	Fuel Clunk	1
2-C	128-99	Fuel Tank	1
2-Hardware	0003	m3 Washer-Large	8
2-Hardware	0007	6mm Washer	1
2-Hardware	0011-4	m5 x 15 x 0.8 Washer	1
2-Hardware	0014-F	m5 Fine Thread Hex Nut	1
2-Hardware	0029	m2.2 x 13 Phillips Self-Tapping	4
2-Hardware	0057	m4 x 4 Socket Set Screw	2
2-Hardware	0058-1	m4 x 6 Socket Set Screw	4
2-Hardware	0060-1	m3 x 6 Socket Bolt	10
2-Hardware	0061	m3 x 8 Socket Bolt	12
2-Hardware	0062-2	m3 x 12 Tapered Socket Head Bolt	2
2-Hardware	0063	m3 x 10 Socket Bolt	6
2-Hardware	0064-3	m3 x 6 Button Head Socket Bolt	4
2-Hardware	0067	m3 x 14 Socket Bolt	8
2-Hardware	0078-5	m4 x 10 Socket Bolt	2
3-A	128-140	Aluminum Tail Boom	1
3-A	128-142	T/R Control Rod	1
3-A	128-148	Boom Support Assembly	2
3-A	128-193	m3 x 440 Flybar	1
4-A	127-15	13T Tailrotor Pulley	1
4-A	127-16	T/R Output Shaft	1
4-A	128-59	Front Boom Support Spacer	1
4-A	128-144	Plastic Rudder Pushrod Guides	3
4-A	128-149 A	Upper Rear Boom Support Clamp	1
4-A	128-149 B	Lower Rear Boom Support Clamp	1
4-A	128-155	Aluminum Transmission Clamp	1
4-A	128-156	m3 Threaded Bearing Stud	2
4-A	128-157	Ball Bearinged T/R Idler	1
4-A	128-158	Aluminum Bellcrank Mount	1
4-A	128-161	C/F Left Tail Plate w/ Bearing	1
4-A	128-164	C/F Right Tail Plate w/ Bearing	1
4-A	128-167	C/F Vertical Fin	1

Kit Contents

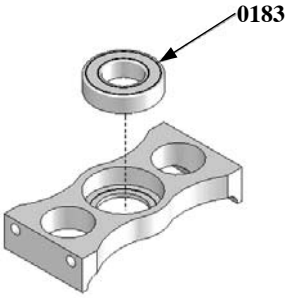
Bag	Part No.	Part Description	Qty
4-B	0133	Ball Link	2
4-B	0159	m3 x 7 x 3 Ball Bearing	2
4-B	0361	Control Ball	4
4-B	0445	Plastic T/R Bellcrank	1
4-B	0446-4	.165" x .310" x .003" S/S Shim	2
4-B	0457	F4-10m Thrust Bearing 3 pc.	2
4-B	0597-3	3/16" x .182" Brass Spacer	1
4-B	0873-1	Plastic T/R Blade Mounts	2
4-B	120-39	m5 x 10 x 4 Ball bearing	2
4-B	122-65	Steel Tail Hub	1
4-B	128-159	T/R Pitch Slider Assembly	1
4-B	128-166	Plastic T/R Blades	2
4-B	3700-155	1.5mm t/r blade mount spacers	4
4-Hardware	0001	m2 Washer	2
4-Hardware	0016-1	m4 External Serrated Lock-Washer	4
4-Hardware	0017	m3 Hex Nut	1
4-Hardware	0019	m3 Locknut	2
4-Hardware	0021	m4 Locknut	2
4-Hardware	0049-3	m2 x 8 Socket Bolt	4
4-Hardware	0053	m3 x 5 Socket Set Screw	1
4-Hardware	0056	m3 x 5 Dog-Point Socket Set Screw	3
4-Hardware	0060-1	m3 x 6 Socket Bolt	9
4-Hardware	0065	m3 x 12 Button head socket bolt	3
4-Hardware	0064-9	m4 x 10 Button Head Socket Bolt	4
4-Hardware	0091	m3 x 16 Phillips Bolt	1
4-Hardware	0097	m3 x 22 Phillips Bolt	2
5-A	0107	m3 x 6 Threaded Control ball	3
5-A	0109	m3 x 8 Threaded Control Ball	4
5-A	0112	m3 x 9.5 Threaded Ball	2
5-A	0159	m3 x 7 x 3 Ball Bearing	4
5-A	0217	Swashplate	1
5-A	0219	Plastic Washout Hub	1
5-A	0221	Plastic Washout Arms	2
5-A	0597-2	Brass Spacer	2
5-A	0869	Plastic Washout Link	2
5-A	128-174	Swashplate Guide Pin	1
5-A	128-176	m2 x .584" Washout Pivot Pins	2
5-B	0103	m2 x 5 Threaded Control Ball	6
5-B	0133	Plastic Ball Links	8
5-B	0337	m2 x 30 Threaded Control Rod	3
5-B	0367	m2 x 60 Threaded Control Rod	1
5-B	0390	Push-on Wire Retainers	3
5-B	106-22	Rubber grommet	2
5-B	115-94	Rear canopy Grommets	2
5-B	120-99	Canopy Knob	2
5-B	128-36	C/F Servo Arm A;ignment Gauge	1
5-B	128-170	Plastic Servo Blocks	2
5-B	128-172	G-10 Servo Retainers	1
5-B	128-173	.090" Carbon Cyclic Servo Spacers	1
5-B	3200-46	1/2" x 20" hook and loop tape	1
5-B	3200-48	3/4" x 15"hook and loop tape	1

Bag	Part No.	Part Description	Qty
5-Hardware	0015	m2 Hex Nut	6
5-Hardware	0038	M2.5 x 10 Phillips Bolt	8
5-Hardware	0039-2	m2.5 x 16 Phillips Bolt	12
5-Hardware	0051	m3 x 3 Socket set Screw	3
5-Hardware	0067	m3 x 14 Socket bolt	2
5-Hardware	0095	m3 x 19 Phillips Bolt	2
5-Hardware	0447-1	m1.5 E-Clips	2
6-A	0112	m3 x 9.5 Threaded Control Ball	2
6-A	0133	Ball Link	4
6-A	0337	m3 x 30 Threaded Control Rod	2
6-A	128-180	Head Block Assembly	1
6-A	128-189	Flybar Control Bar	2
6-A	128-190	Flybar paddle	2
6-A	128-192	Flybar Control Arm with Base	2
6-A	128-195	Head Button	1
6-B	0109	m3 x 8 Threaded Control Ball	2
6-B	0112	m3 x 9.5 Threaded Control Ball	2
6-B	128-188	Main Blade Grip w / 0319 Brg.	2
6-B	128-196	3-D Bell Mixer Assembly	2
6-B	3700-150	1mm main rotor blade grip spacers	4
6-C	0133-1	Grey Ball Links	8
6-C	0319	m8 x 16 x 5 Ball Bearing	2
6-C	0324	m10.75 x 16 x 1 Washer	2
6-C	0331	m8 x 14 x .5 Shim Washer	4
6-C	0332	m8 x 14 x 1 Shim Washer	2
6-C	0840-12	3 pc. Thrust Bearing	2
6-C	0844-6	90D Head Dampner O-Rings	4
6-C	0848-2	m8 Retaining Clips	2
6-C	0848-9	Clip Application Tool	1
6-C	120-7	C/F Washer m5 x 5.5	2
6-C	120-25	m3 x 86 Threaded Control Rod	2
6-C	128-187	Head Axel 8mm	1
6-C	128-198	m3 x 16 Dowel Pin	1
6-Hardware	0021	m4 Locknut	2
6-Hardware	0053-5	m3 x 16 Socket Set Screw	2
6-Hardware	0057	m4 x 4 Socket Set Screw	3
6-Hardware	0063	m3 x 10 Socket Bolt	2
6-Hardware	0064-3	m3 x 6 Button Head Socket bolt	4
6-Hardware	0067	m3 x 14 Socket bolt	1
6-Hardware	0082	m4 x 38 Socket bolt	2
6-Hardware	0086	m5 x 12 Flanged Socket bolt	2
6-Hardware	0091	m3 x 16 Phillips Bolt	2
BOX	128-200	Canopy	1
BOX	128-210	Instruction Set	1
BOX		Towel	1

Bag 1 Hardware

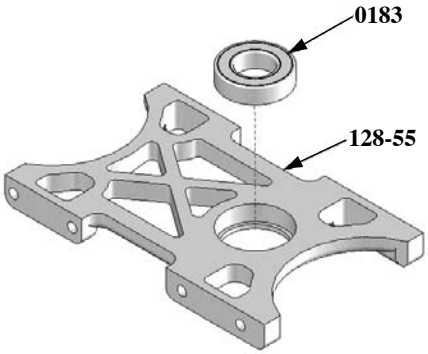
	0019	m3 Locknut
	0058-5	m5 x 8 Dog-Point Set Screw
	0058-6	m5 x 5 Socket Set srew
	0059-1	m2.5 x 6 Socket Bolt
	0060-1	m3 x 6 Socket Bolt
	0061	m3 x 8 Socket Bolt
	0062-2	m3 x 12 Tapered Socket Head Bolt
	0064-3	m3 x 6 Button Head Socket Bolt
	0067	m3 x 14 Socket Bolt

Bag 1 Parts Pre-Assembled from Factory



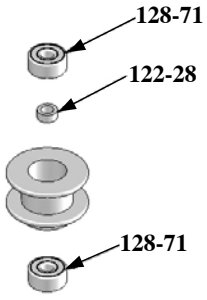
128-40

Lower Main Shaft Bearing Block



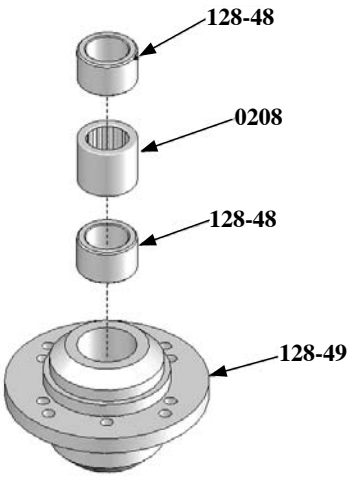
128-55

Upper Main Shaft Bearing Block



128-70

Aluminum Idler Pulleys



128-49

Autorotation Hub

Getting Started

Bag 1

Locate bag 1, and the hardware for bag 1. Please take the time to identify the hardware for this bag. **Please note that the use of medium thread locking compound is always required when a part is threaded into metal.**

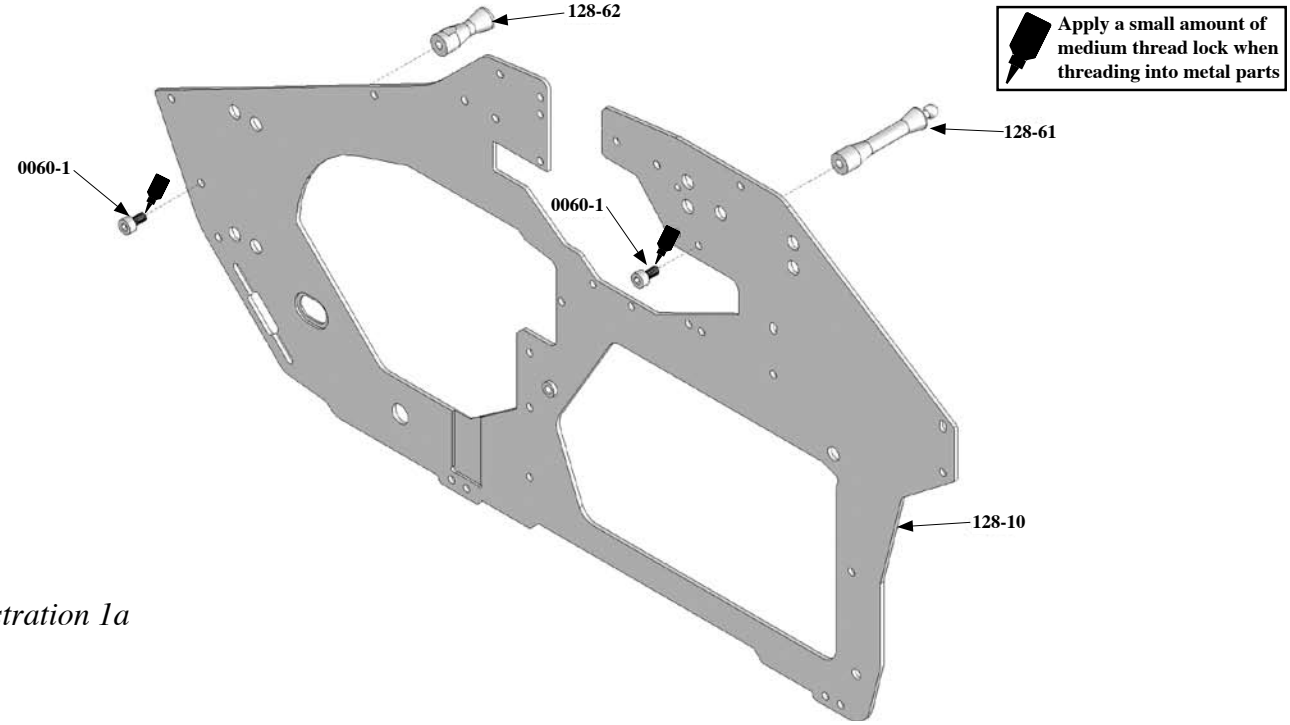


Illustration 1a

Locate the right main frame side MA128-10, rear canopy mount MA128-61, front canopy mount MA128-62, and two MA0060-1 m3x6 socket bolts. Please refer to *Illustration 1a* for step. Install the canopy mounts on the outside of the right main frame.

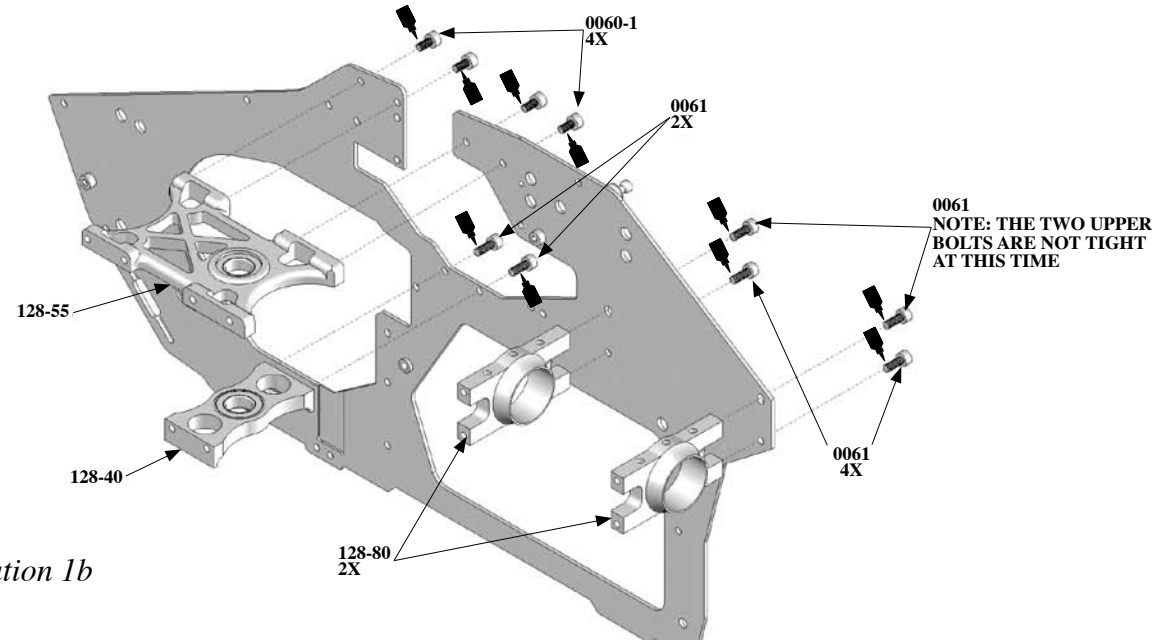


Illustration 1b

Locate the MA128-55 upper main shaft bearing block, MA128-40 lower main shaft bearing block, two MA128-80 boom clamps, six MA0061 m3x8 socket bolts, and four MA0060-1 m3x6 socket bolts. Please refer to *Illustration 1b* for the correct placement of components in this step. Using the MA0060-1 m3x6 socket bolts, attach the MA128-55 upper main shaft bearing block, but do not fully tighten the bolts at this time. Using two MA0061 m3x8 socket bolts attach the MA128-40 lower bearing block as shown. the bolts for the bearing blocks need to remain slightly loose as the bearing blocks will have to be properly aligned in a later step. Using MA0061 m3x8 socket bolts, attach the MA128-80 boom clamp blocks. Do not fully tighten the upper MA0061 m3x8 socket head bolts at this time, these will be tightened after the boom is installed in a later step. Go ahead and tighten the lower MA0061 m3x8 socket bolts into the MA128-80 boom clamp blocks now.

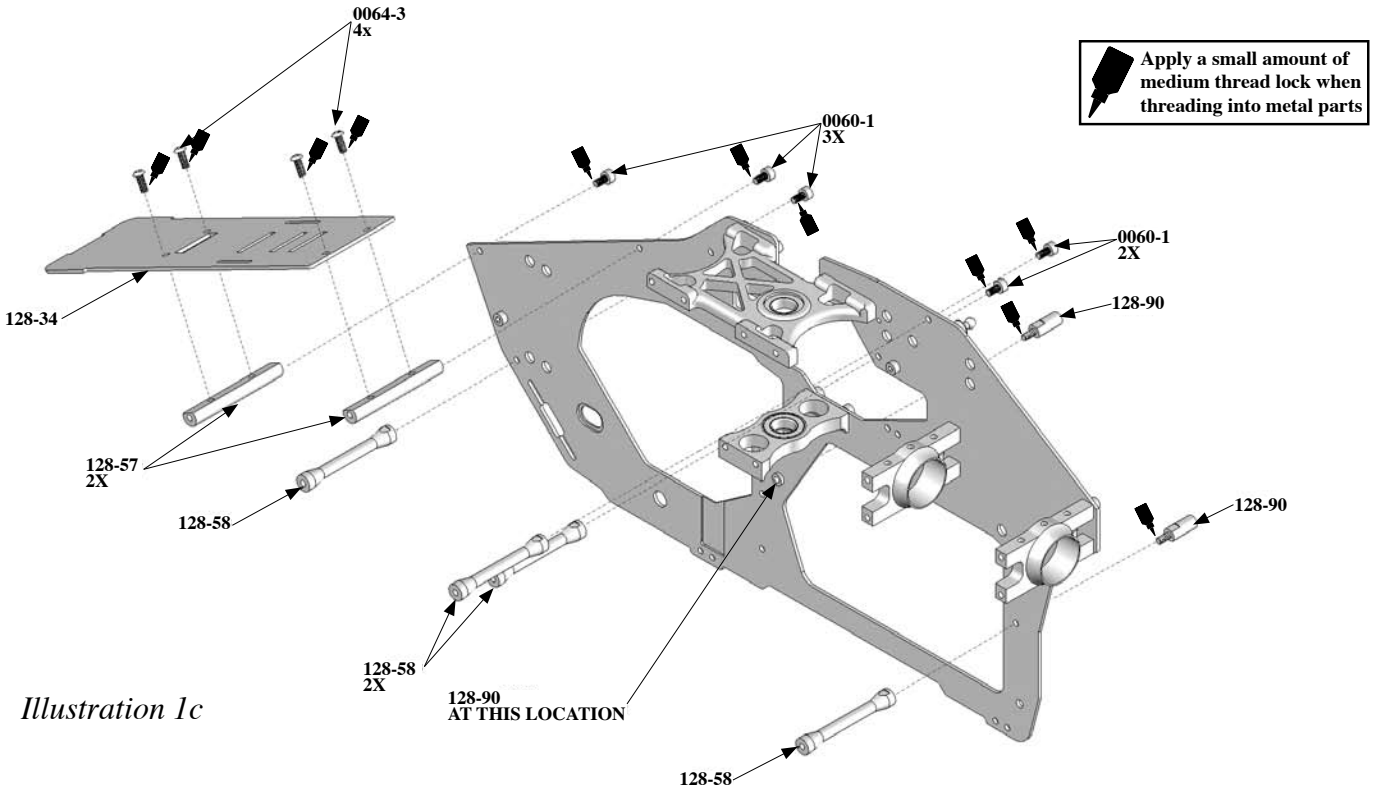
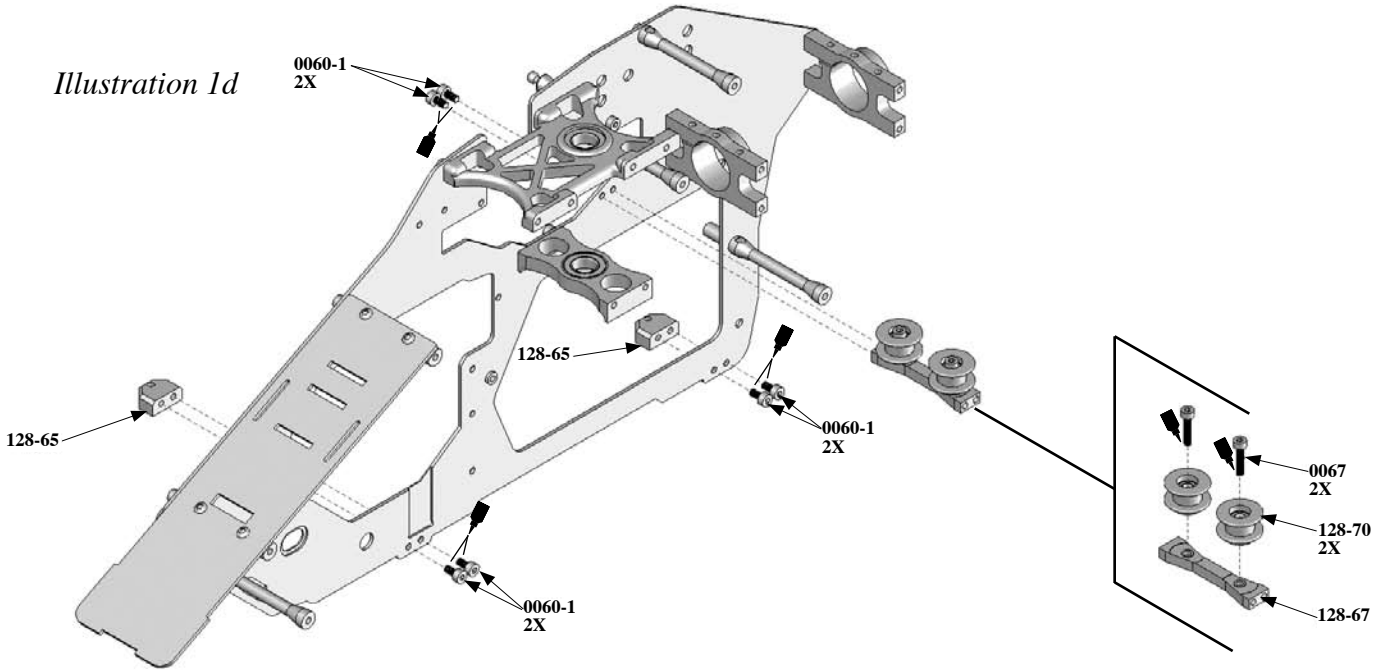


Illustration 1c

Locate the MA128-34 radio plate, two MA128-57 aluminum tray mounts, four MA128-58 frame spacers, two MA128-90 tank plate threaded stud mounts, five MA0060-1 m3x6 socket bolts, and four MA0064-3 m3x6 button head socket bolts. Refer to *Illustration 1c* for this step. Attach the MA128-34 radio plate to the two MA128-57 aluminum tray mounts using four MA0064-3 m3x6 button head socket bolts then attach the radio tray to the right side frame using two MA0060-1 m3x6 socket bolts. Attach the MA128-58 frame spacers. Note that in *Illustration 1c*, three of the four MA128-58 frame spacers use a MA0060-1 m3x6 socket bolt to attach to the right main frame side, but the most rearward MA128-58 frame spacer uses a MA128-58 tank plate threaded stud mount. The other MA128-90 tank plate threaded stud mount, installs into a PEM nut in the frame.

Illustration 1d



Locate the MA128-67 aluminum pulley mount, two MA128-70 aluminum idler pulley's (note that the bearings have been installed at the factory), two MA0067 m3x14 socket bolts, two MA128-65 aluminum mounting blocks and six MA0060-1 m3x6 socket bolts. Refer to *Illustration 1d* for this step. Take care when inserting the MA0067 m3x14 socket bolt through the bearing in the MA128-70 aluminum idler pulley not to get any thread locking compound into the bearing itself. Use two MA0060-1 m3x6 socket bolts to attach the tension pulley assembly to the right main side frame. Use four MA0060-1 m3x6 socket bolts to attach the two MA128-65 aluminum mounting blocks to the outside of the right main side frame.

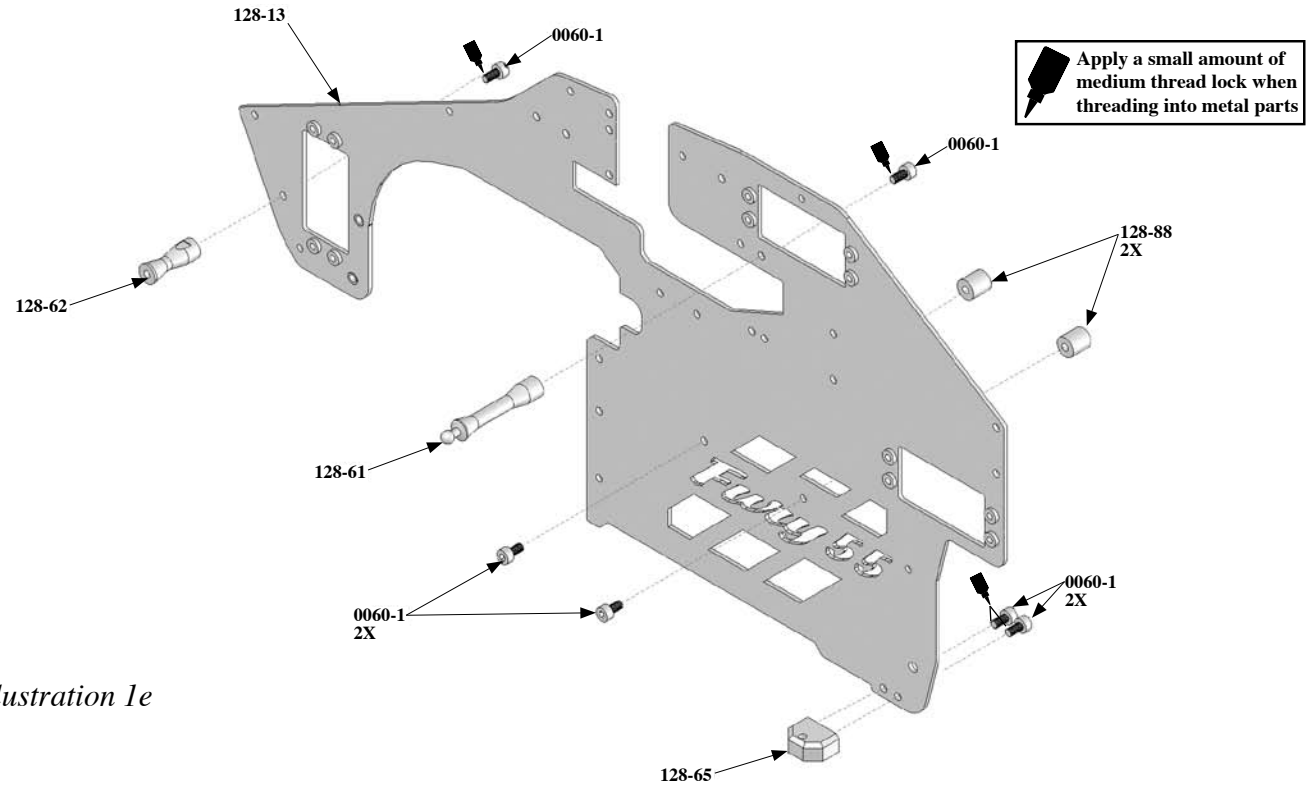


Illustration 1e

Locate the MA128-13 left main side frame, two MA128-88 rubber fuel tank mounts, one MA128-65 aluminum landing gear mounting block, one MA128-61 rear canopy mount, one MA128-62 front canopy mount, and six MA0060-1 m3x6 socket bolts. Refer to *Illustration 1e* for this step. Using six MA0060-1 m3x6 socket bolts, attach these components as shown in the illustration. Note that the two rubber fuel tank mounts are mounted on the inside of the frame.

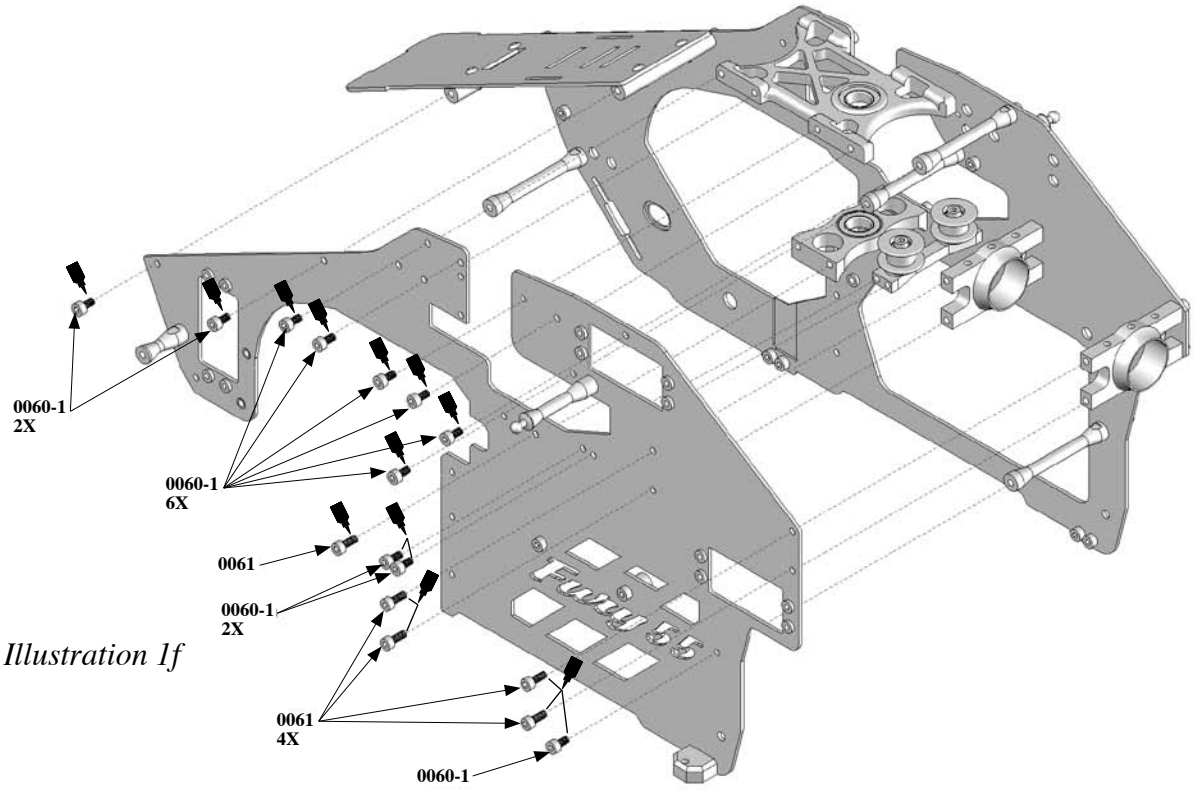
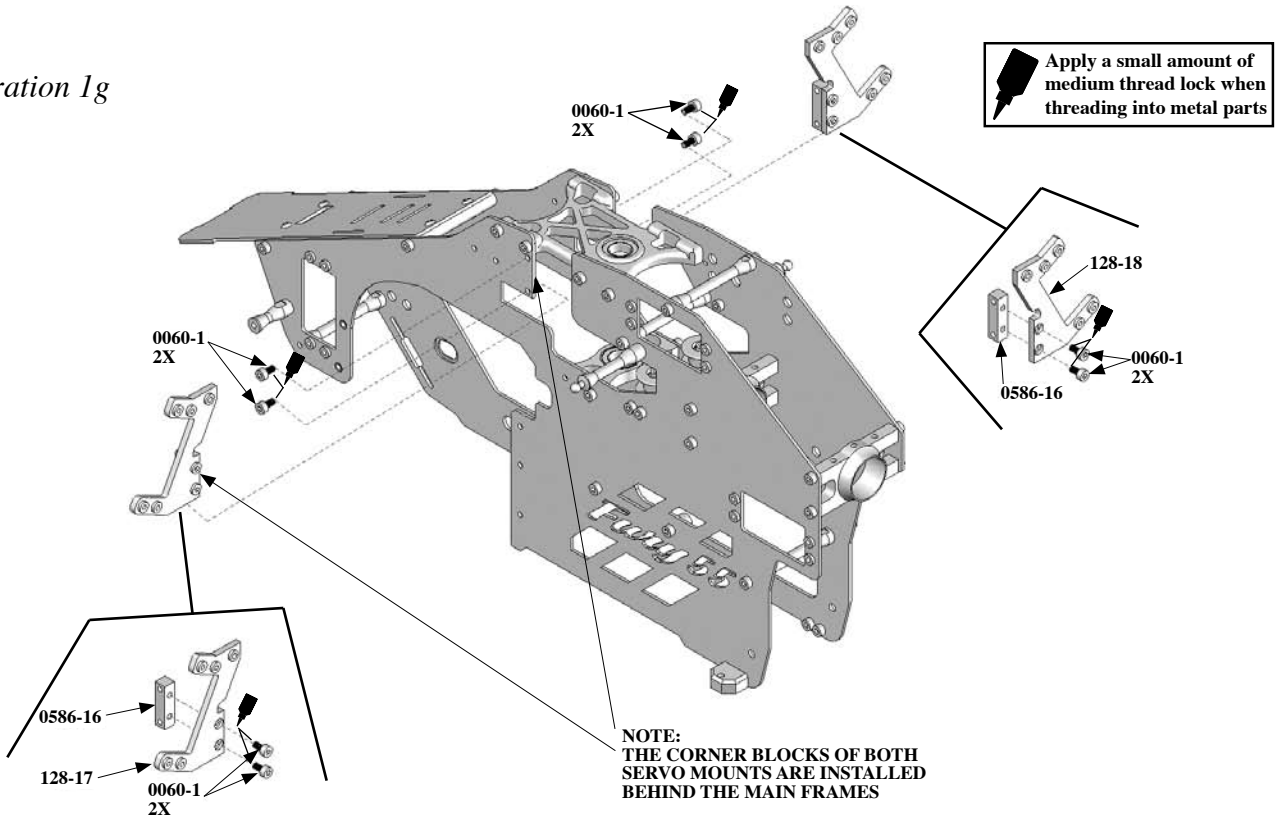


Illustration 1f

Locate eleven MA0060-1 m3x6 socket bolts, and five MA0061 m3x8 socket bolts. It is time to join the right side frame to the left side frame. Refer to *Illustration 1f* for this step. Thread in the MA 0060-1 m3x6 socket bolts into the upper bearing block and one MA0060-1 m3x6 socket bolt and one MA0061 m3x8 socket bolt into the lower bearing block as show. Note that the bolts threading into the upper and lower bearing blocks should not have been fully tightened at this time, as they need to remain slightly loose to allow for the alignment. Locate the MA128-43 main shaft from bag 1-C. Insert the main shaft into the bearing blocks and ensure that it rotates freely in the bearings. With the main shaft inserted through both upper and lower bearing blocks, go ahead and tighten all six socket bolts into the upper and lower main shaft bearing blocks. After the socket bolts are tight, pull the main shaft back out, and set it aside for a later step.

Illustration 1g



Locate the MA128-17 left servo mount, the MA128-18 right servo mount, two MA0586-16 corner blocks, and eight MA0060-1 m3x6 socket bolts. Refer to *Illustration 1g* for this step. Attach the MA0586-16 corner block to the MA128-17 left servo mount, and MA128-18 right servo mount. These servo mounts will now mount to the right and left side frames, using MA0060-1 m3x6 socket bolts. Note that the corner blocks of both servo mounts are installed inside the main frames as shown in the illustration.

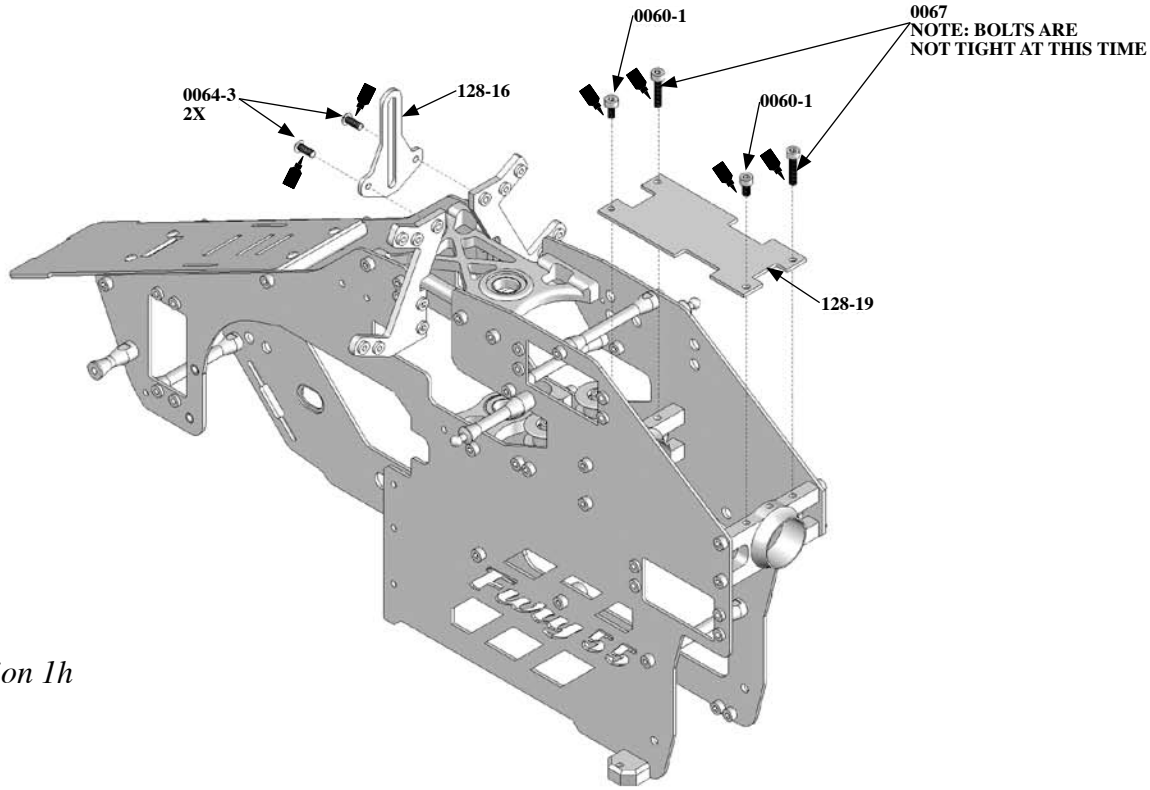


Illustration 1h

Locate the MA128-19 gyro plate, the MA128-16 anti-rotation guide, two MA0060-1 m3x6 socket bolts, two MA0067 m3x14 socket bolts, and two MA0064-3 m3x6 button head socket bolts. Refer to *Illustration 1h* for this step. Attach the MA128-16 anti-rotation guide to the front of the servo mounts using the MA0064-3 m3x6 button head socket bolts. There is a PEM nut installed into the servo mount at the factory. Attach the MA128-19 gyro plate to the boom clamps using two MA0060-1 m3x6 socket bolts on the left side. On the right side of the MA128-19 gyro plate, use two MA0067 m3x14 socket bolts, but do not fully tighten at this time.

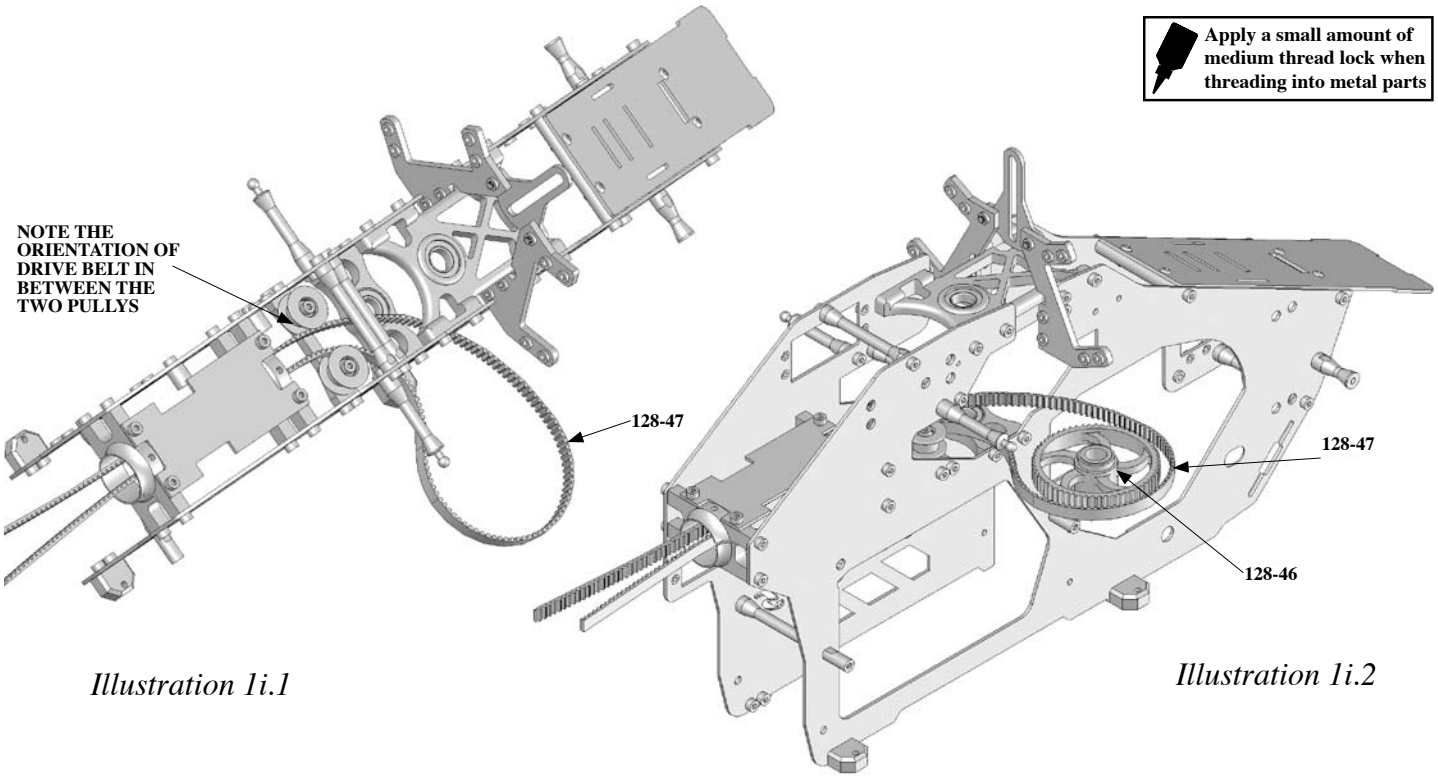

Apply a small amount of medium thread lock when threading into metal parts
NOTE THE ORIENTATION OF DRIVE BELT IN BETWEEN THE TWO PULLYS
128-47
128-47
128-46

Illustration 1i.1

Illustration 1i.2

Locate the MA128-47 tail rotor drive belt, and the MA128-46 tail rotor drive pulley. Refer to *Illustrations 1i.1* and *1i.2* for this step. Insert the tail rotor drive belt through the boom clamps as shown in the illustrations. Note the orientation of the tail rotor drive belt in between the two tension pulleys. Place the tail rotor drive pulley on top of the lower bearing block, keeping correct orientation of the drive belt between the tension pulleys.

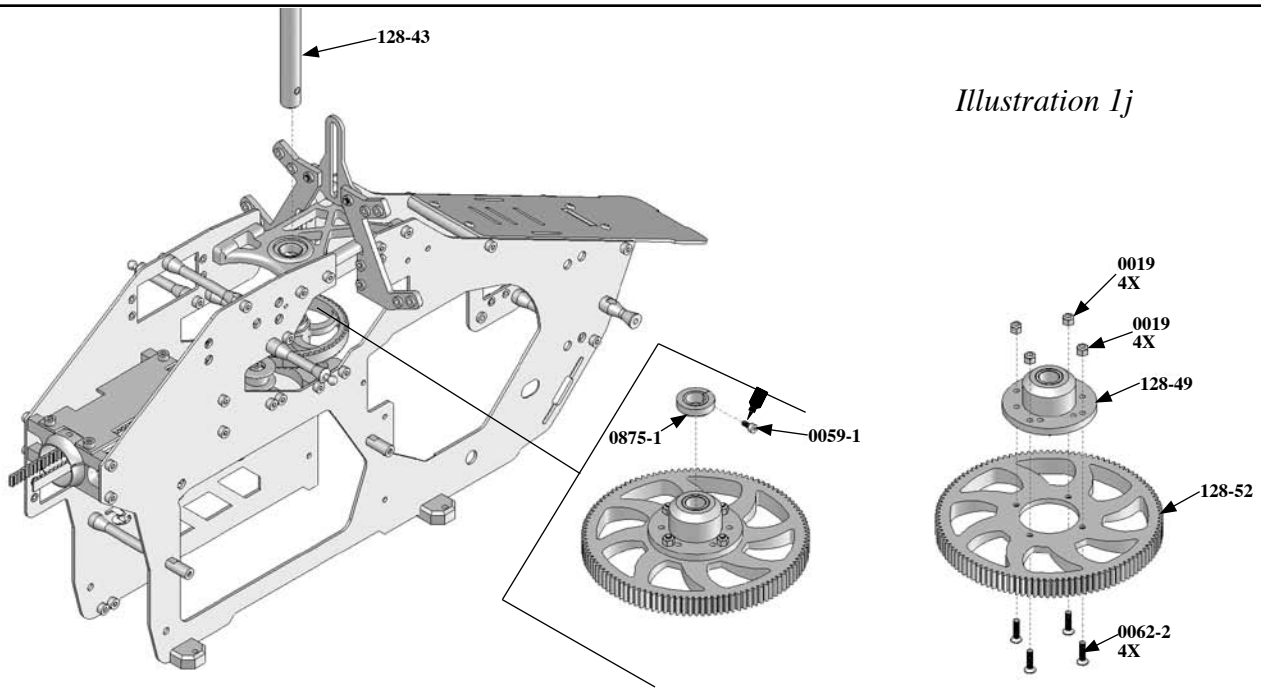
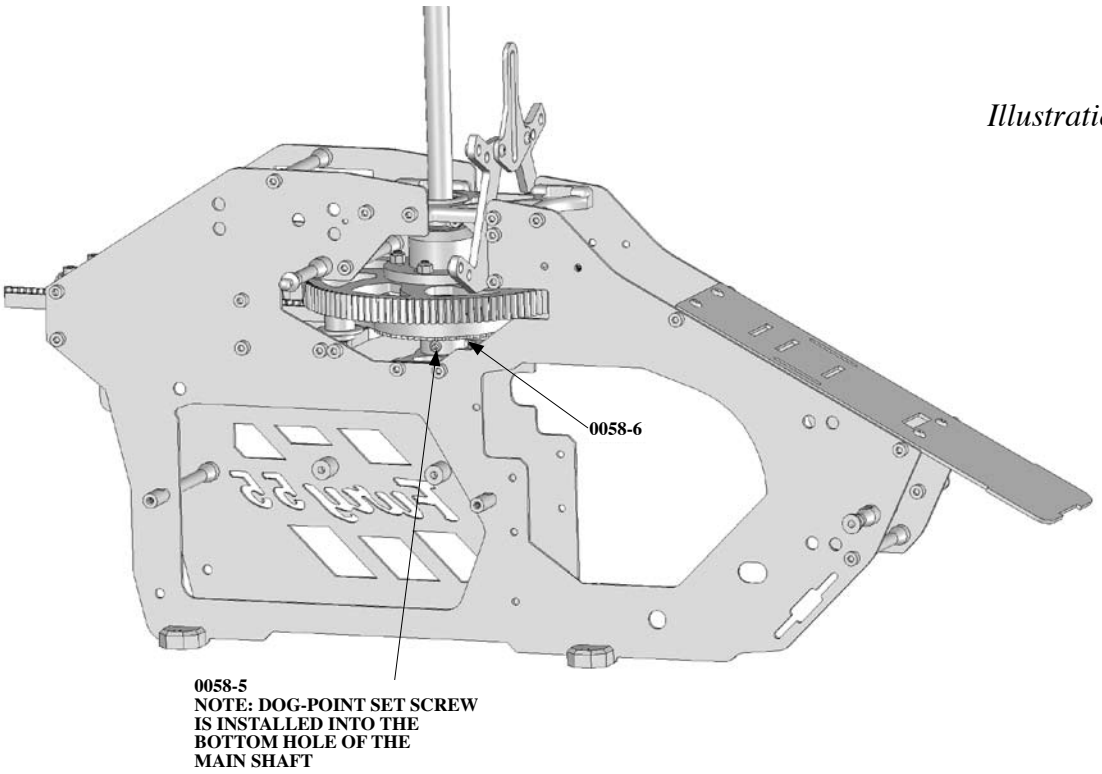


Illustration 1j

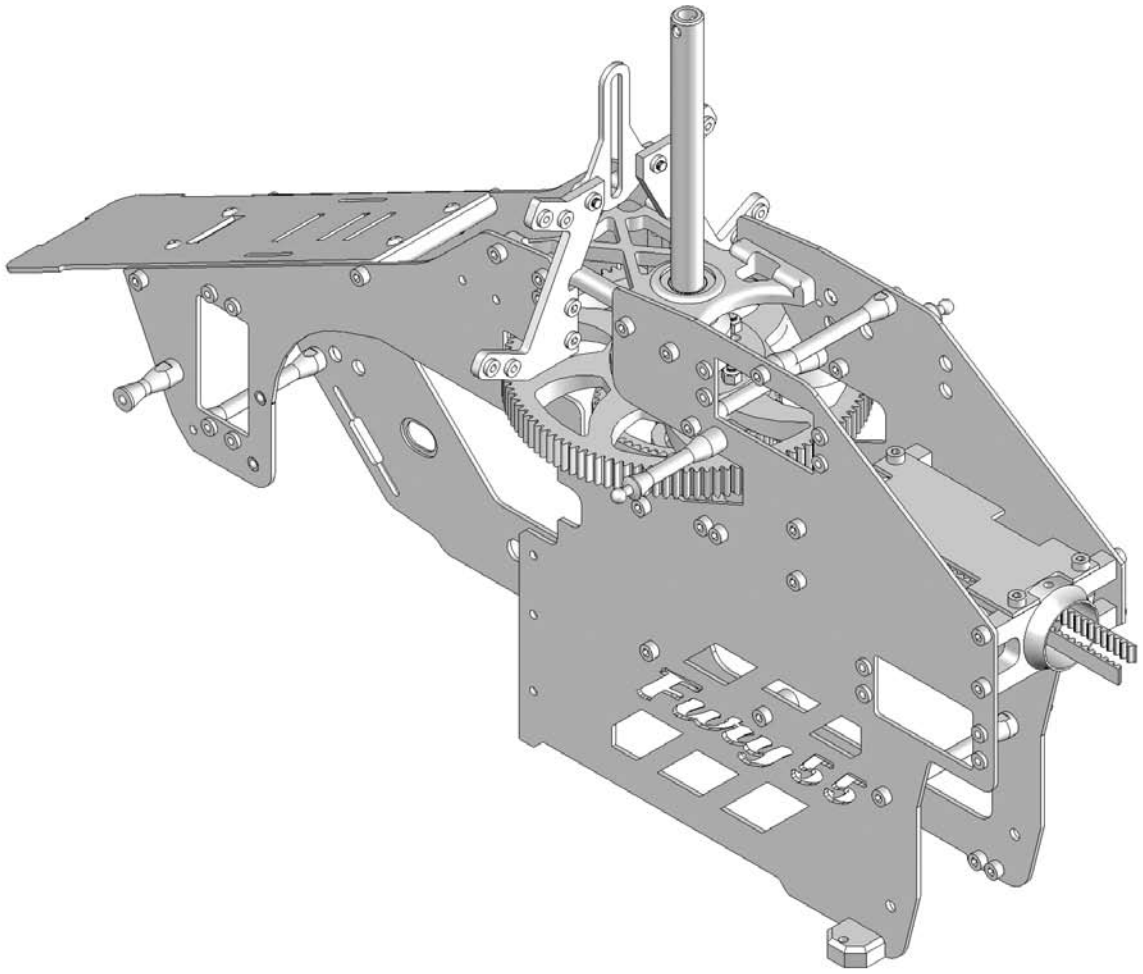
Locate the MA128-52 main gear, MA128-49 autorotation hub, MA128-43 main shaft, MA0875-1 main shaft collar, MA0059-1 m2.5x6 socket bolt, four MA0062-2 m3x12 tapered socket bolts, and four MA0019 m3 locknuts. Refer to *Illustration 1j* for this step. Start by assembling the autorotation hub to the main gear. The use of Tri-flow oil MA3200-02 is recommended to lubricate the Torrington bearing in the MA128-49 autorotation hub. Tighten the MA0019 m3 locknuts equally around the hub. Do not use thread locking compound on lock nuts. Loosely thread the MA0059-1 m2.5x6 socket bolt into the MA0875-1 main shaft collar. Carefully slide the entire assembly into the frame above the tail rotor drive pulley. The MA128-43 main shaft is then inserted down through the bearing blocks. (Note the orientation of the main shaft. The top of the main shaft has a hole all the way through, and the bottom of the main shaft has a hole that only goes through half way.) Apply light pressure down on the main shaft, while tightening the MA0059-1 m2.5x6 socket bolt. While tightening this bolt ensure that the collar is pushed up towards the upper main shaft, eliminating main shaft vertical play.

Illustration 1k



Locate the MA0058-5 m5x8 dog-point set screw, and the MA0058-6 m5x5 socket set screw. Refer to *Illustration 1k* for this step. These will both be threaded into the MA128-46 tail rotor drive pulley. The MA0058-5 m5x8 dog-point set screw will thread into the pulley, and extend into the indention on the main shaft. The MA0058-6 m5x5 socket set screw will simply tighten against the main shaft.

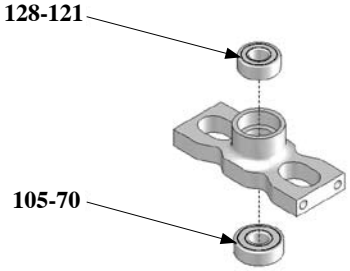
Bag 1 Completed Assembly



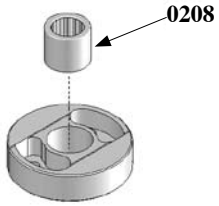
Bag 2 Hardware

0003	m3 Washer-Large	
0007	6mm Washer	
0011-4	m5 x 15 x 0.8 Washer	
0014	m5 Hex Nut	
0029	m2.2 x 13 Phillips Self-Tapping	
0057	m4 x 4 Socket Set Screw	
0058-1	m4 x 6 Socket Set Screw	
0060-1	m3 x 6 Socket Bolt	
0061	m3 x 8 Socket Bolt	
0062-2	m3 x 12 Tapered Socket Head Bolt	
0063	m3 x 10 Socket Bolt	
0064-3	m3 x 6 Button Head Socket Bolt	
0067	m3 x 14 Socket Bolt	
0078-5	m4 x 10 Socket Bolt	

Bag 2 Parts Pre-Assembled from Factory

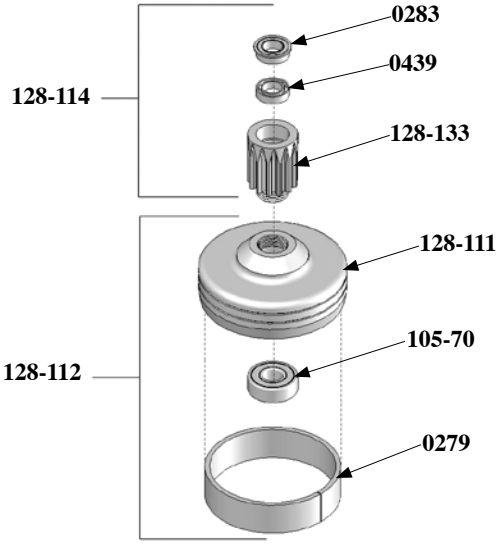


128-40
Clutch Drive Bearing Block



128-106
Centrifugal Clutch

128-109
Start Shaft Assembly



128-110
Clutch Bell Unit

Bag 2

Locate bag 2, and the hardware for bag 2. Please take the time to identify the hardware for this bag.

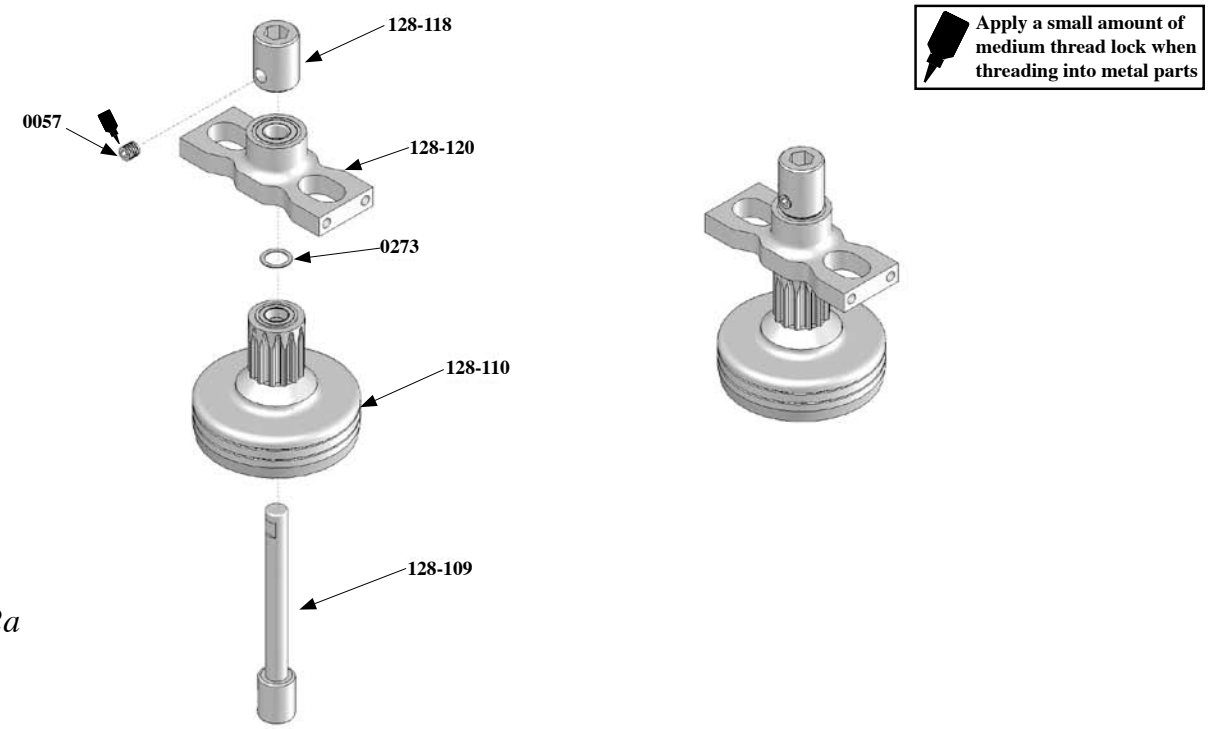


Illustration 2a

Locate the MA128-118 hex start adaptor, MA128-120 clutch drive bearing block, MA128-110 clutch bell unit, MA128-109 start shaft assembly, MA0273 steel shim washer, and two MA0057 m4x4 set screws. Insert the MA128-109 start shaft assembly into the MA128-110 clutch bell unit. Refer to *Illustration 2a* for this step. Place the MA0273 steel shim washer onto the top of the start shaft. Insert the start shaft through the MA128-120 clutch drive bearing block, taking note of the orientation of the block. Insert the MA128-118 hex start adaptor onto the start shaft, and line up the flat spot with the threaded hole on the hex start adaptor. Thread the MA0057 m4x4 set screw into the hex start adaptor, taking care not to allow vertical play in the start shaft assembly.

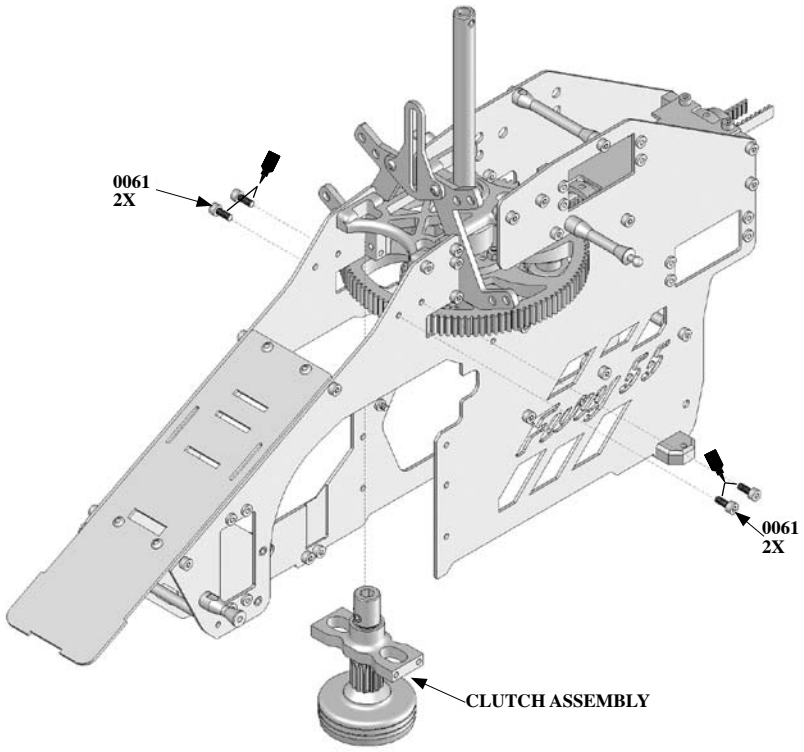
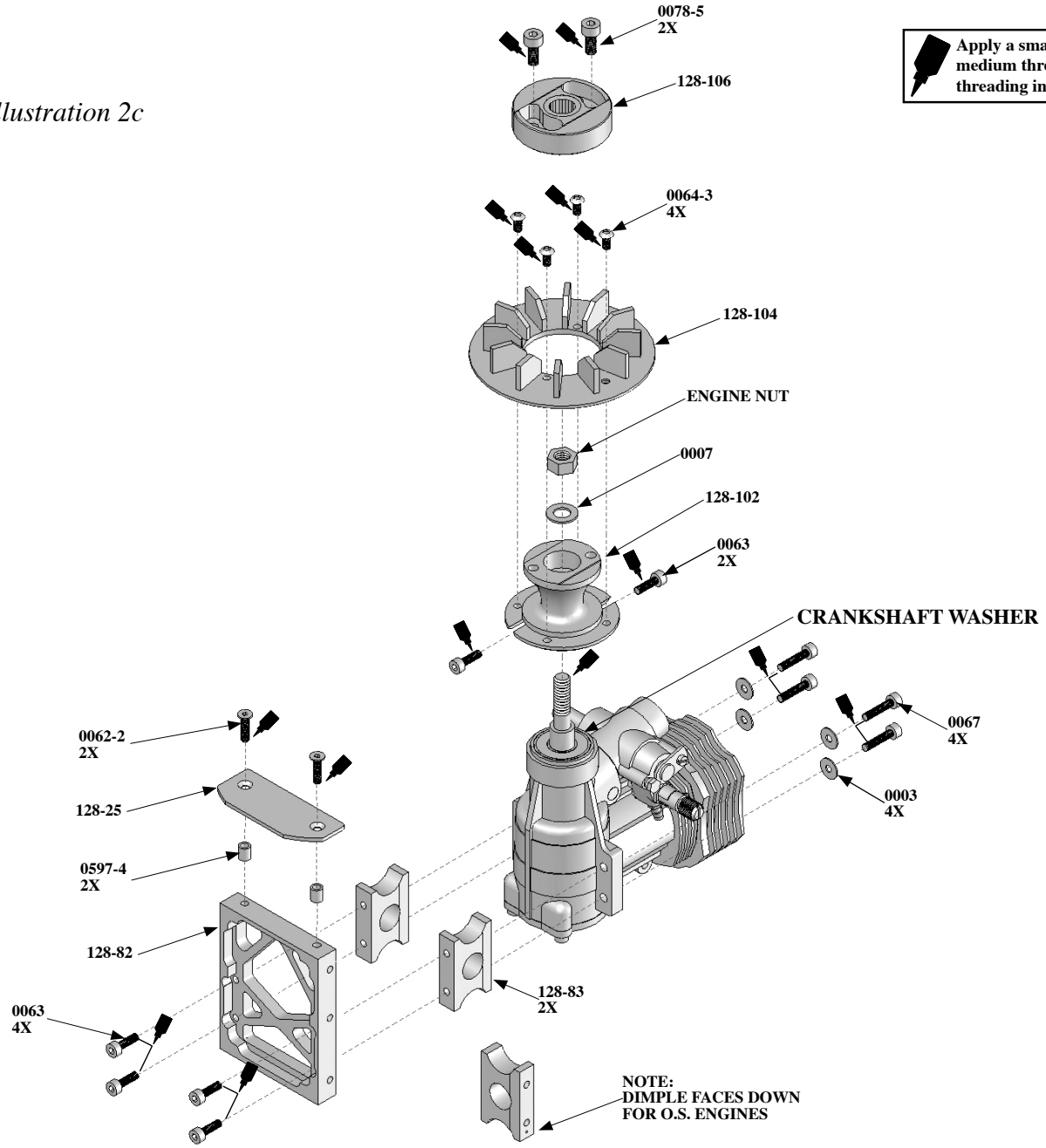


Illustration 2b

Locate the frame assembly from bag 1, the clutch assembly you just assembled, and four MA0061 m3x8 socket bolts. Refer to *Illustration 2b* for this step. Insert the clutch assembly into the frame assembly, thread the four MA0061 m3x8 socket bolts into the clutch drive bearing block.

Illustration 2c



Locate the “50 size” engine you intend to use, MA128-106 centrifugal clutch, MA128-104 aluminum fan, MA128-102 aluminum fan hub, MA128-25 fan shroud plate, two MA0597-4 brass spacers, MA128-82 motor mount base, two MA128-83 motor mounts, two MA0078-5 m4x10 socket bolts, four MA0064-3 m3x6 button head socket bolts, the MA0007 6mm washer, six MA0063 m3x10 socket bolts, four MA0067 m3x14 socket bolts, four MA0003 m3 washers, and two MA0062-2 m3x12 tapered socket head bolts. Miniature Aircraft USA also recommends the use of a crankshaft locking tool MA3000-34. Refer to *Illustration 2c* for this step. The engine you intend to use came with a crankshaft washer, and a crankshaft nut, you WILL use these parts with your Fury 55. Place the crankshaft washer onto the crankshaft. Slide the aluminum fan hub onto the crankshaft. Slide the MA0007 6mm washer onto the crank shaft. Install the crankshaft nut onto the crankshaft of the engine. Remove the back plate from the engine, and insert the crankshaft locking tool. GENTLY tighten the crankshaft nut until it BEGINS to snug down. When the nut is properly “snugged” you will notice no gap between the aluminum fan hub and the crankshaft washer. You will also notice as the nut is snugged down, there will be no crankshaft play. It is CRITICAL that this nut is not “cranked down” at this point, as the fan hub will become distorted. Thread the two MA0063 m3x10 socket bolts into the aluminum fan hub. Place the aluminum fan onto the aluminum fan hub, and line up the mounting holes. Thread in the four MA0064-3 m3x6 button head socket bolts, attaching the fan to the fan hub. Set the centrifugal clutch onto the aluminum fan hub, thread the two MA0078-5 m4x10 socket bolts through the clutch and into the fan hub. Set the engine aside. Use four MA0063 m3x10 socket bolts to attach the MA128-82 motor mount base to the MA128-83 motor mounts. Please take care to note the correct orientation of these parts as shown in the illustration. Also note that the “dimple” in the motor mount should be facing “down”. Using two MA0062-2 m3x12 tapered socket head bolts, two MA0597-4 brass spacers, attach the MA128-25 fan shroud plate to the MA128-82 motor mount base as shown in the illustration. Use four MA0067 m3x14 socket bolts, and four MA0003 m3 washers, attach the completed engine mount assembly to the engine as shown in the illustration.

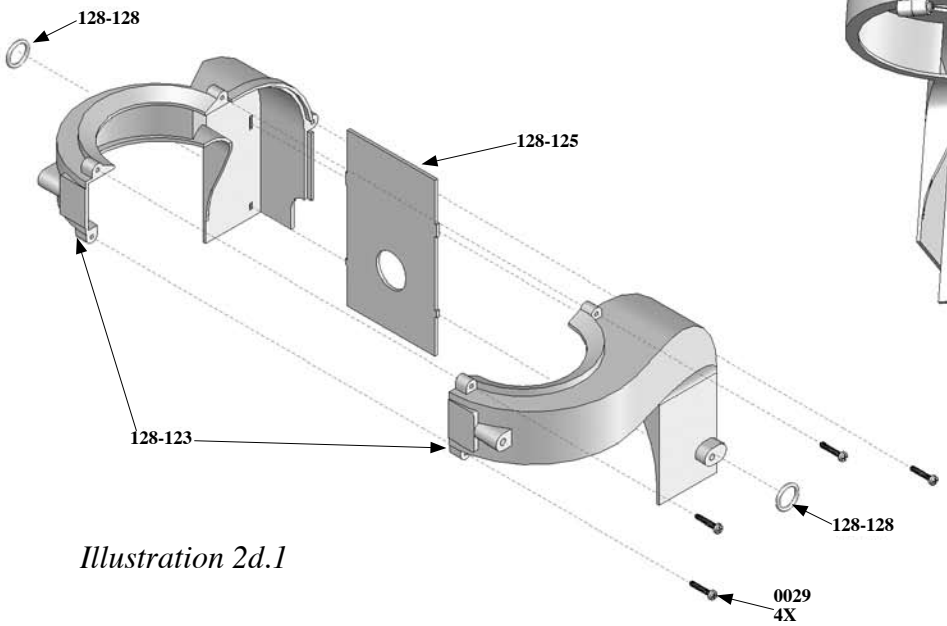


Illustration 2d.1

Illustration 2d.2

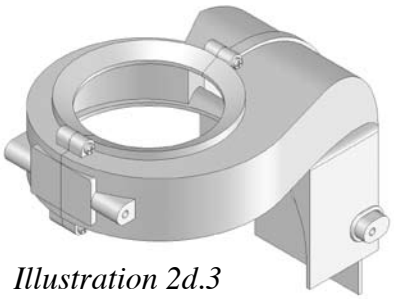


Illustration 2d.3

Locate the MA128-123 fan shroud set, the MA128-125 shroud deflector, two MA128-128 rubber "o" rings, and four MA0029 m2x2x13 Phillips self tapping screws. Refer to *Illustration 2d.1, 2d.2* and *2d.3* for this step. Bring the two sides of the MA128-123 fan shroud set together with the MA128-125 shroud deflector between them. If there is flashing on the MA128-123 fan shroud, it can be easily trimmed with a razor knife. Note the correct orientation of these parts in the illustration. Use the four MA0029 m2.2x13 self tapping Phillips screws to join the fan shroud set together. Stretch the two MA128-128 rubber "o" rings over the alignment tabs as shown.

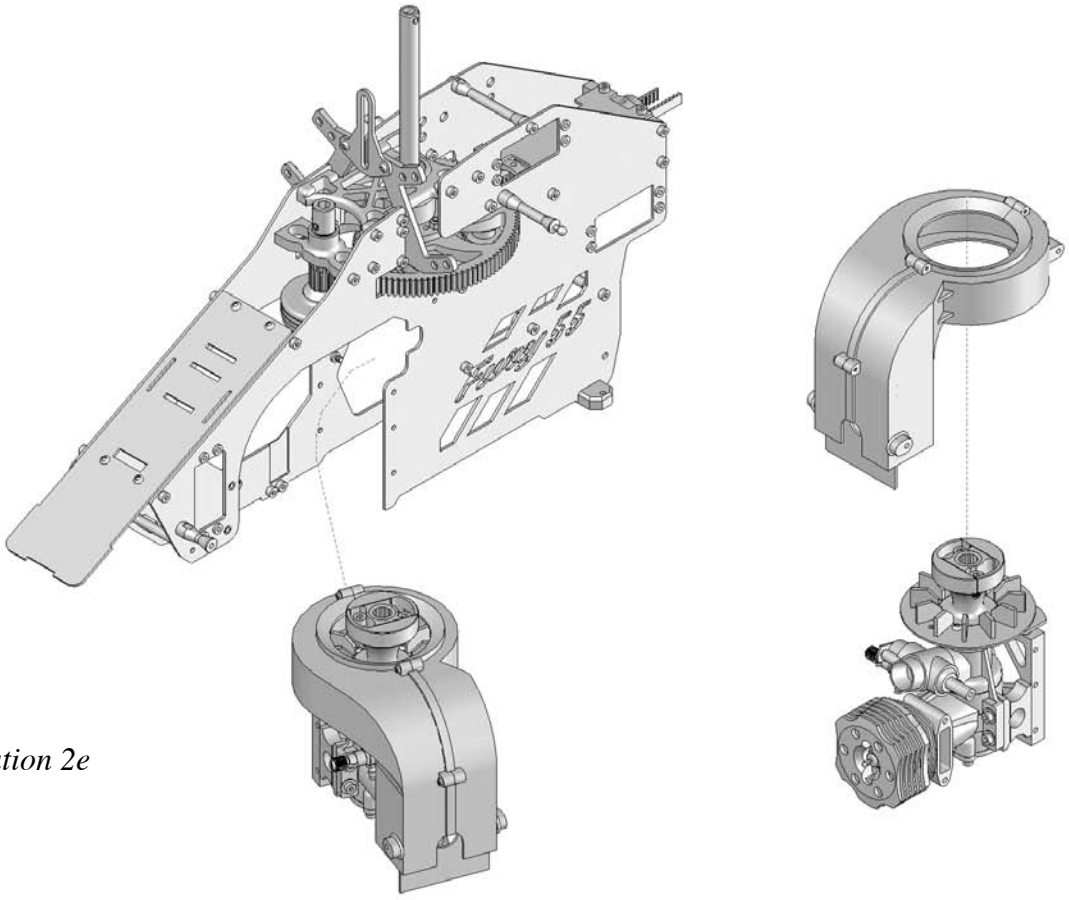


Illustration 2e

Place the completed fan shroud assembly onto the completed engine assembly. This will install from the left side of the main frame assembly. Refer to *Illustration 2e*.

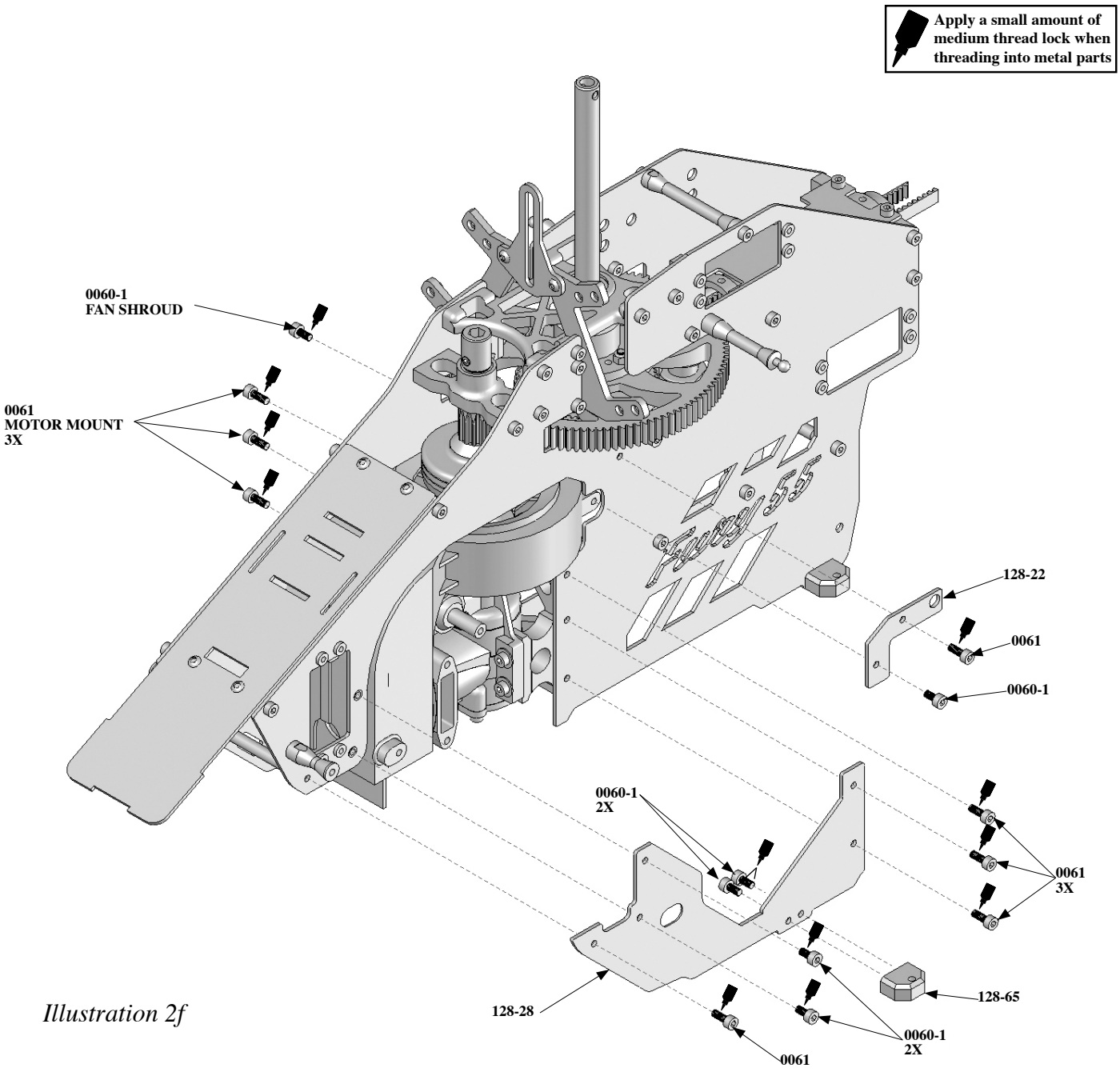


Illustration 2f

Locate the MA128-28 left front frame plate, the MA128-22 rear fan shroud mount, 128-65 landing gear mounting block, six MA0060-1 m3x6 socket bolts, and eight MA0061 m3x8 socket bolts. Refer to *Illustration 2f* for this step. Attach the engine assembly motor mount to the RIGHT side frame using three of the MA0061 m3x8 socket bolts. Use two MA0060-1 m3x6 socket bolts to attach the MA128-65 landing gear mounting block to the MA128-28 left front frame plate. Use one MA0061 m3x8 socket bolt, and one MA0060-1 m3x6 socket bolt to attach the MA128-22 rear fan shroud mount to the left main frame. Use four MA0061 m3x8 socket bolts, and two MA0060-1 m3x6 socket bolts to mount the MA128-28 left front frame plate to the left main frame as shown in the illustration.

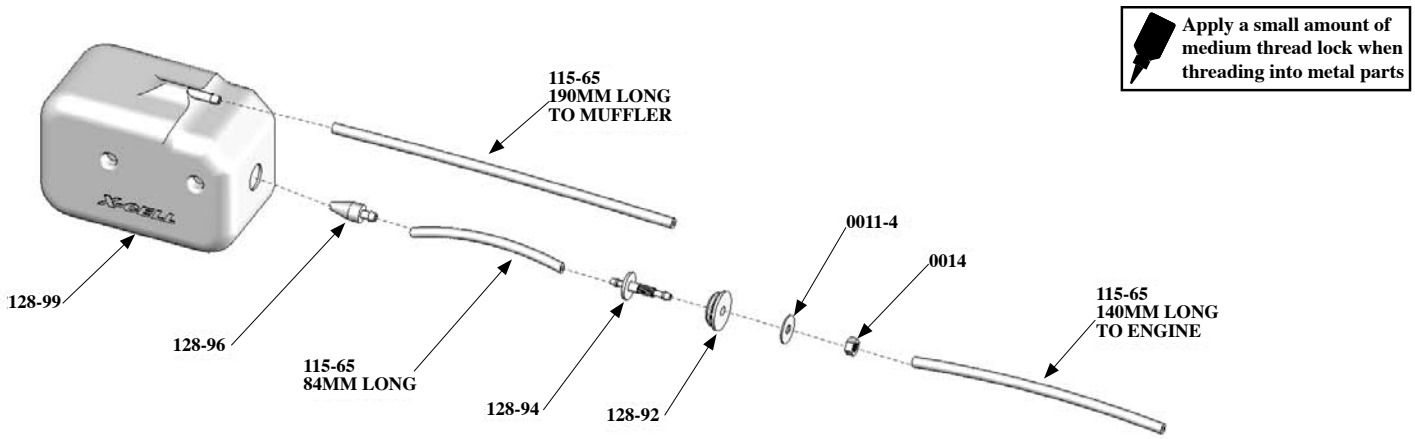


Illustration 2g.1

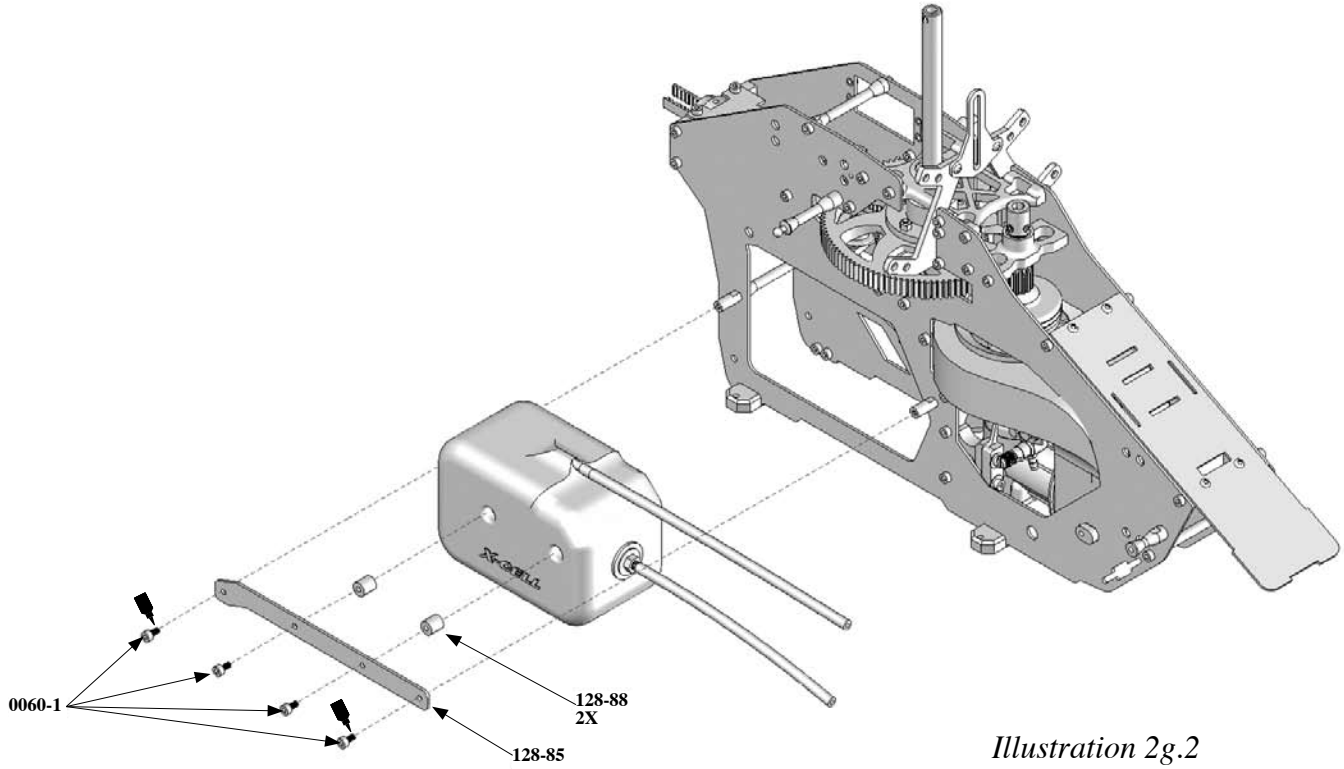


Illustration 2g.2

Locate the MA128-99 fuel tank, MA128-96 fuel clunk, MA128-94 fuel nipple, MA128-92 rubber fuel tank plug, MA0011-4 m5x15x0.8 washer, MA0014-F m5 fine thread hex nut, and the MA115-65 fuel line. Refer to *Illustrations 2g.1* and *2g.2* for this step. Cut the MA115-65 fuel line into an 84mm length to use as a clunk line. Attach the MA128-96 fuel clunk and the MA128-94 fuel nipple onto the 84mm clunk line you just cut. Slide the MA128-92 rubber fuel tank plug and then the MA0011-4 washer onto the fuel nipple, followed by the MA0014 hex nut. Before fully tightening the MA0014-F m5 fine tread hex nut, carefully push the clunk and line into the fuel tank, and push the rubber fuel tank plug into the fuel tank opening. You will notice the fuel tank "seat" onto the groove of the rubber fuel tank plug. Now tighten the MA0014-F m5 fine tread hex nut. Tightening this nut expands the rubber fuel tank plug to make the seal between the rubber fuel tank plug and the tank. With the remaining piece of fuel line, we have found that a 190mm piece works from the tank vent to the muffler pressure nipple, and a 140mm piece works from the fuel nipple to the carburetor of the engine. The fuel tank can now be inserted into the main frame assembly. You must determine the routing of the fuel lines to suit your model and specific accessories. Locate the MA128-85 tank mounting plate, two MA128-88 rubber fuel tank mounts, and four MA0060-1 m3x6 socket bolts. Use two MA0060-1 m3x6 socket bolts to attach the MA128-88 rubber fuel tank mounts to the MA128-85 tank mounting plate. Use two MA0060-1 m3x6 socket bolts to attach the MA128-85 tank mounting plate to the right main frame. Ensure that the MA128-88 rubber fuel tank mounts are seated into the dimples on the fuel tank.

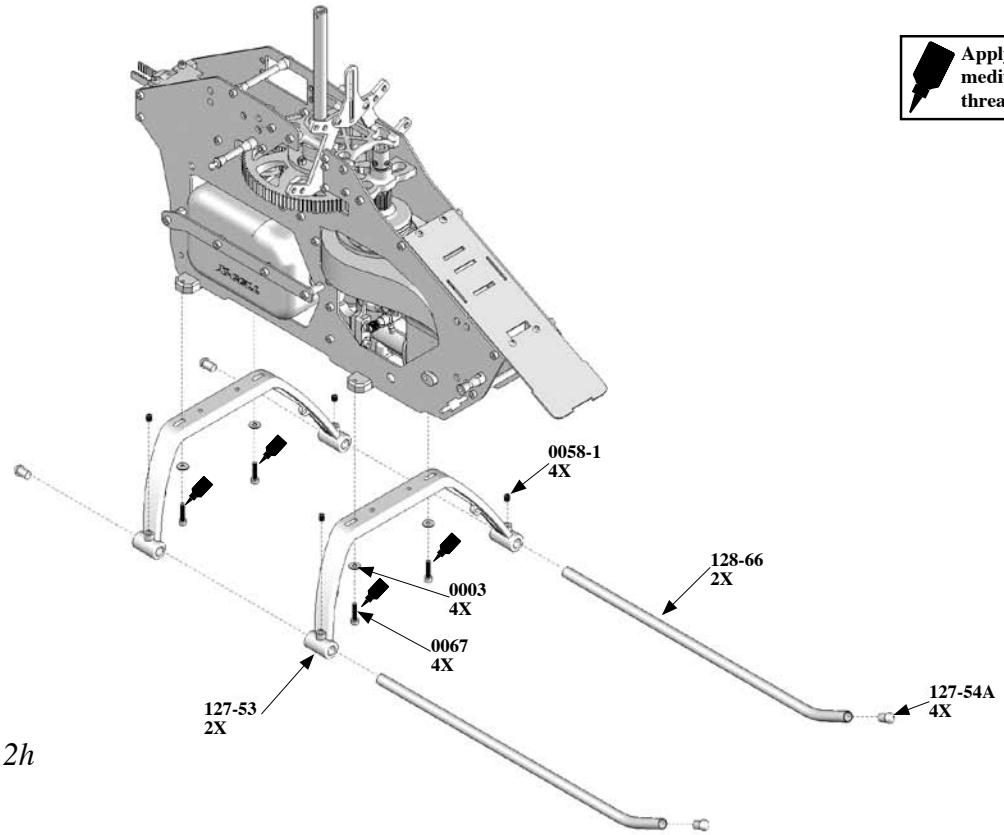
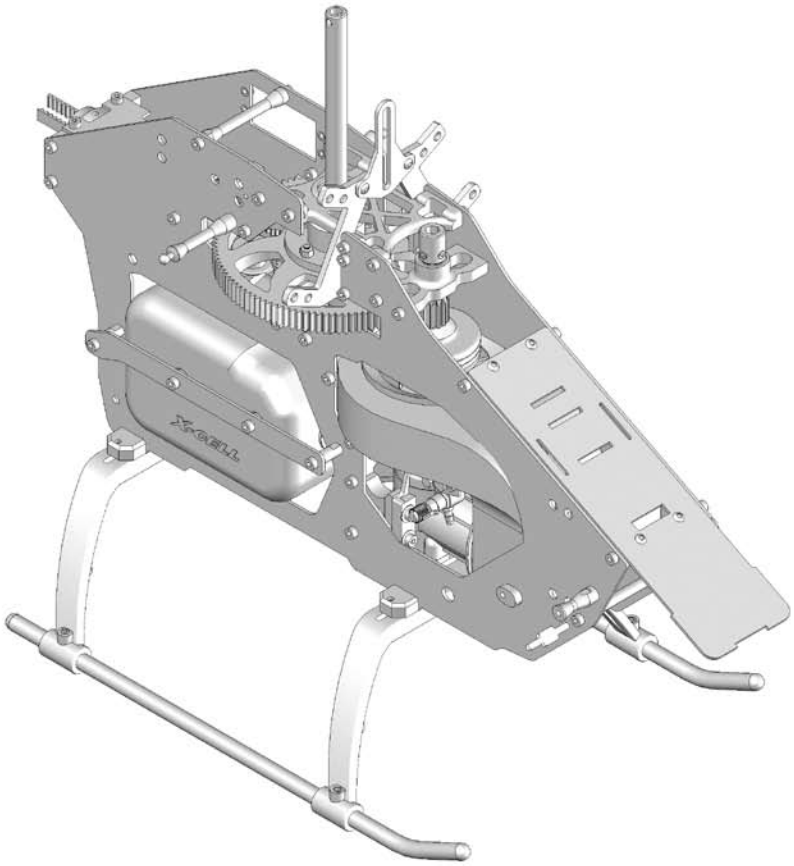


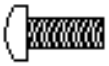
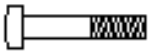
Illustration 2h

Locate the MA127-53 plastic struts, two MA128-66 aluminum skids, four MA127-54 skid plugs, four MA0067 m3x14 socket bolts, four MA0003 m3 washers, and four MA0058-1 m4x6 socket set screw. Please refer to *Illustration 2h* for this step. Using four MA0067 m3x14 socket screws, and four MA0003 m3 washers, attach the plastic struts to the aluminum landing gear mounting blocks. Slide the two MA128-66 aluminum skids through the struts, and position them as desired. Thread the MA0058-1 m4x6 socket set screws into the strut, and gently tighten just enough to prevent the skid from moving in the strut. Place a small amount of CA (cyanoacrylate) on each of the MA127-54 skid plugs, and push them into the MA128-66 aluminum skids.

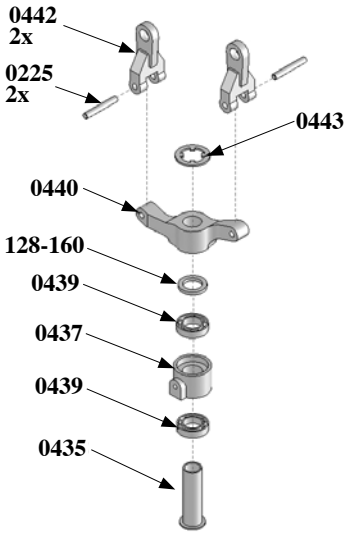
Bag 2 Completed Assembly



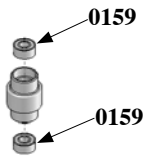
Bags 3–4 Hardware

	0019	m3 Lock Nut
	0021	m4 Lock Nut
	0049-3	m2 x 8 Socket Bolt
	0053	m3 x 5 Socket Set Screw
	0056	m3 x 5 Dog-Point Socket Set Screw
	0058-3	m4 x 16 Socket Set Screw
	0060-1	m3 x 6 Socket Bolt
	0065	m3 x 12 Socket Bolt
	0064-9	m4 x 10 Button Head Socket Bolt
	0091	m3 x 16 Phillips Bolt

Bags 3–4 Parts Pre-Assembled from Factory

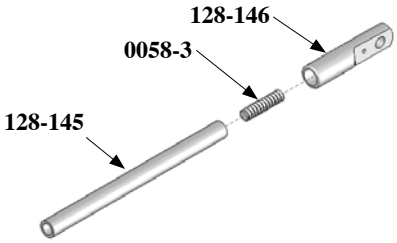


128-159
Tail Rotor Pitch Slider Assembly



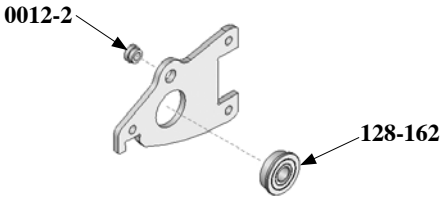
128-157

Tail Rotor Idler



128-148
ONLY ONE SIDE SHOWN

Boom Support Assembly



128-161 LEFT "SHOWN"
128-164 RIGHT

Tail Plate Assembly

Bags 3-4

Locate bag 3 & 4, and the hardware for bag 3 & 4. Please take the time to identify the hardware for this bag.

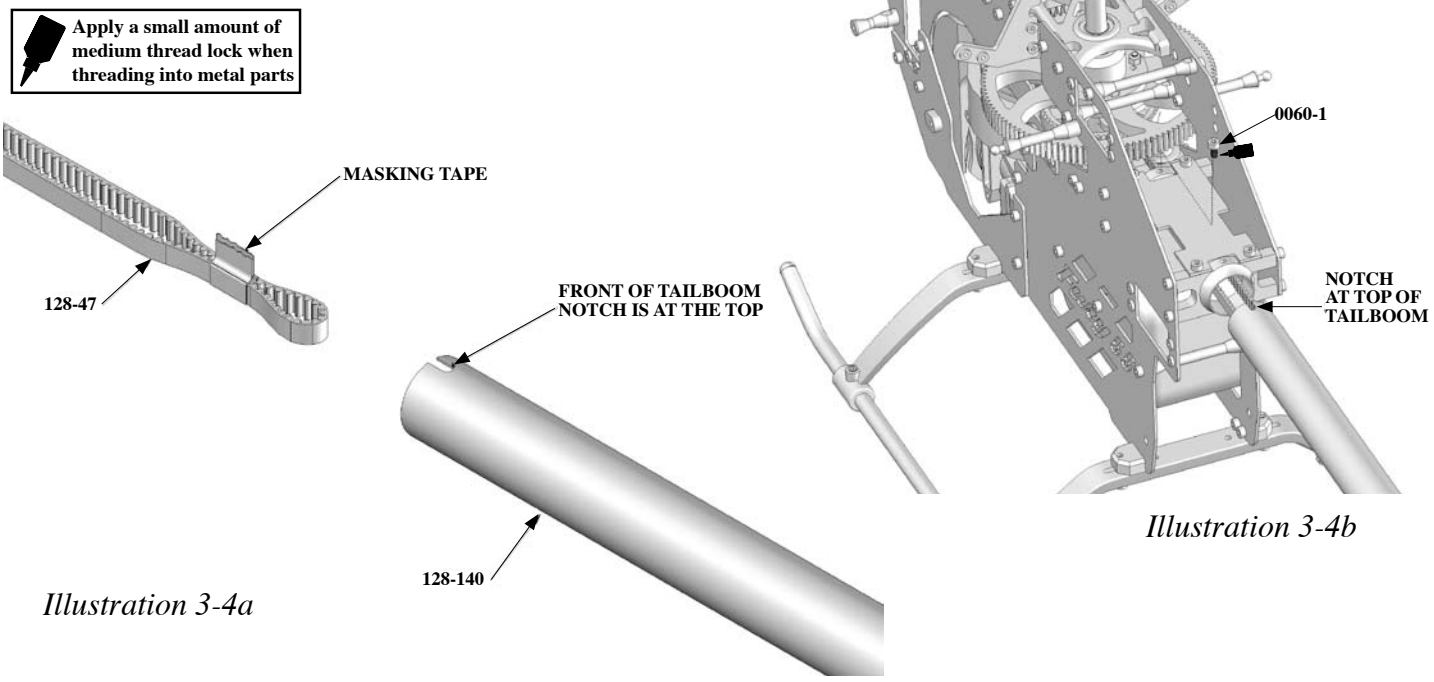
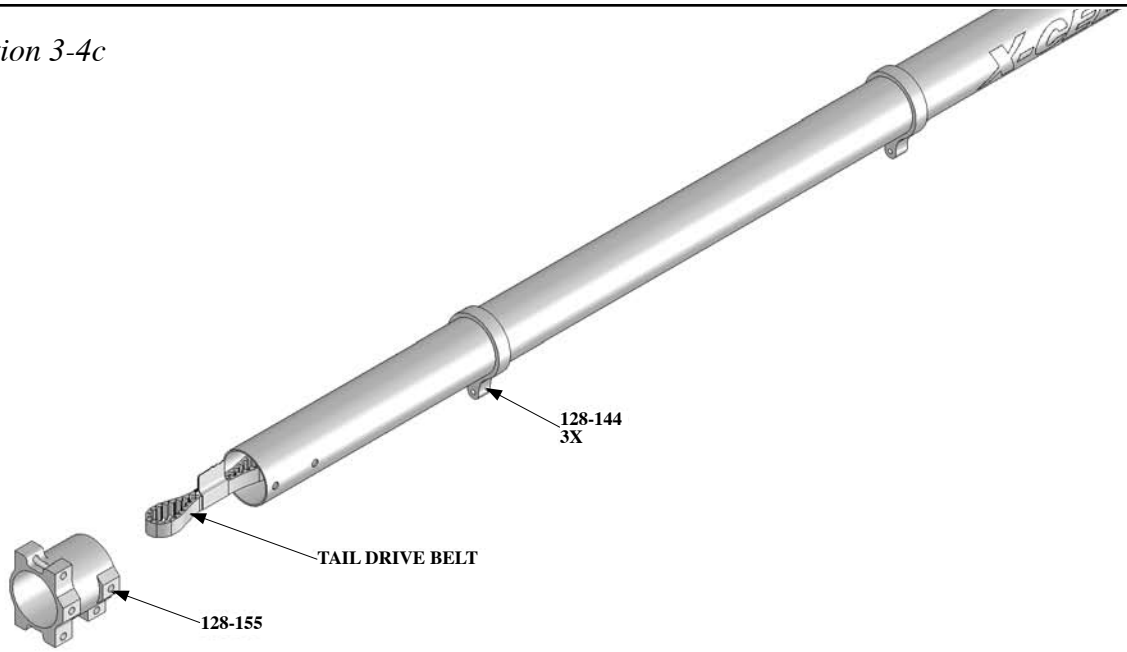

Apply a small amount of medium thread lock when threading into metal parts
MASKING TAPE
128-47
FRONT OF TAILBOOM NOTCH IS AT THE TOP
128-140
0060-1
NOTCH AT TOP OF TAILBOOM

Illustration 3-4a

Illustration 3-4b

This step will require some parts from bag 3, and all the parts from bag 4. Refer to *Illustration 3-4a* and *3-4b* for this step. Locate the MA128-140 aluminum tail boom, and one MA0060-1 m3x6 socket bolt. Recall that the tail belt is already installed in the completed frame assembly from step 2. The MA128-47 Tail Rotor drive belt must be inserted through the boom with a counter clockwise ¼ twist. We have found that the simplest way to slide the belt through the boom is to use a bit of masking tape. This allows the belt to slide through the boom, and also allows for determining the correct direction of the ¼ twist. As the belt is slid through the boom, insert the boom into the boom clamps in the frame. Take note that the "notch" in the boom should be facing "up", and thread the MA0060-1 m3x6 socket bolt into the inner boom clamp. This allows for proper alignment of the tail boom.

Illustration 3-4c



Locate three MA128-144 plastic rudder pushrod guides, and the MA128-155 aluminum transmission clamp. Refer to *Illustration 3-4c* for this step. Locate three MA128-144 plastic rudder pushrod guides, and the MA128-155 aluminum transmission clamp. Slide the pushrod guides onto the tail boom. On each pushrod guide there are 3 dimples, slide the pushrod guides on dimple side first. The MA128-144 plastic rudder pushrod guides should be a snug fit. Ideally they will be spaced evenly, on the boom. The MA128-155 transmission clamp can now be slid over the end of the boom. Note the location of the alignment holes in the boom relative to the holes in the transmission clamp.

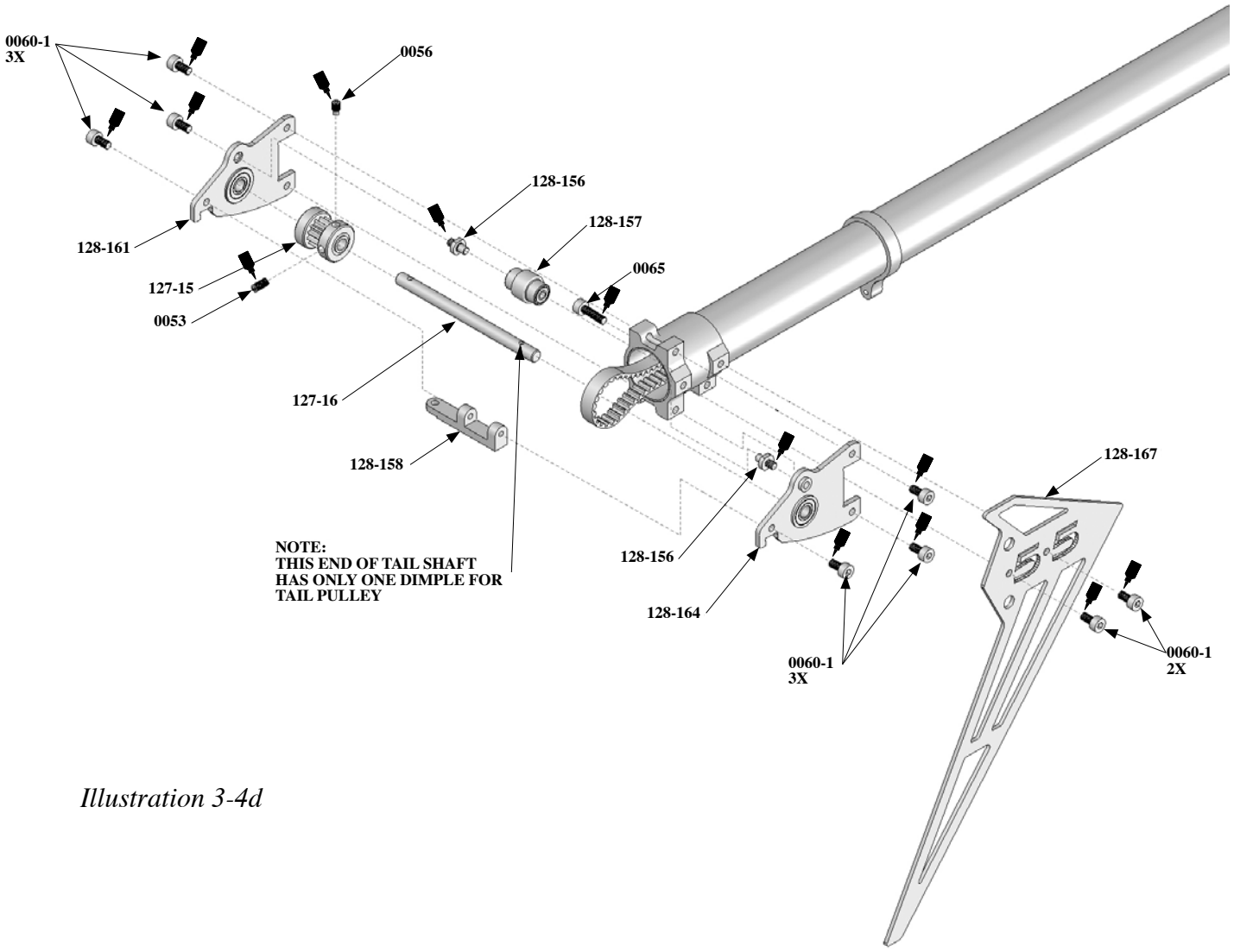


Illustration 3-4d

Locate the MA128-161 left tail plate with bearing, MA127-15 13t T/R pulley, MA127-16 T/R output shaft, MA128-158 aluminum bell crank mount, two MA128-156 m3 threaded bearing studs, MA128-157 ball bearing T/R idler, MA128-164 right tail plate with bearing, and MA128-167 vertical fin, eight MA0060-1 m3x6 socket bolts, one MA0053 m3x5 socket set screw, one MA0056 m3x5 dog-point socket set screw, and one MA0065 m3x12 socket bolt. Refer to *Illustration 3-4d* for this step. Install and tighten the MA0065 m3x12 socket bolt into the transmission clamp ensuring that the alignment holes in the transmission clamp line up with the holes in the tail boom. Using two MA0060-1 m3x6 socket bolts install the MA128-161 left tail plate with bearing, onto the left side of the transmission clamp. Thread one MA128-156 m3 threaded bearing stud into the inside of the left tail plate. Slide the MA127-15 13t T/R pulley onto the MA127-16 T/R output shaft. Install the MA0056 m3x5 dog-point set screw into the pulley, making sure that the dog point of the set screw is engaged into the dimple. Thread in the MA0053 m3x5 socket set screw into the other hole on the pulley. There is no dimple for this set screw, it simply tightens against the T/R output shaft. Remove the masking tape from the boom, keeping track of the ¼ twist. Slide the tail rotor output shaft assembly through the left tail plate, and place the T/R drive belt onto the pulley. Thread the other MA128-156 m3 threaded bearing stud into the inside of the right tail plate. Place the MA128-157 T/R idler onto the left bearing stud, and use two MA0060-1 m3x6 socket screws to install the right T/R plate onto the transmission clamp. Using two MA0060-1 m3x6 socket bolts the MA128-158 aluminum bell crank mount can now be installed. Using two MA0060-1 m3x6 socket bolts, install the MA128-167 vertical fin.

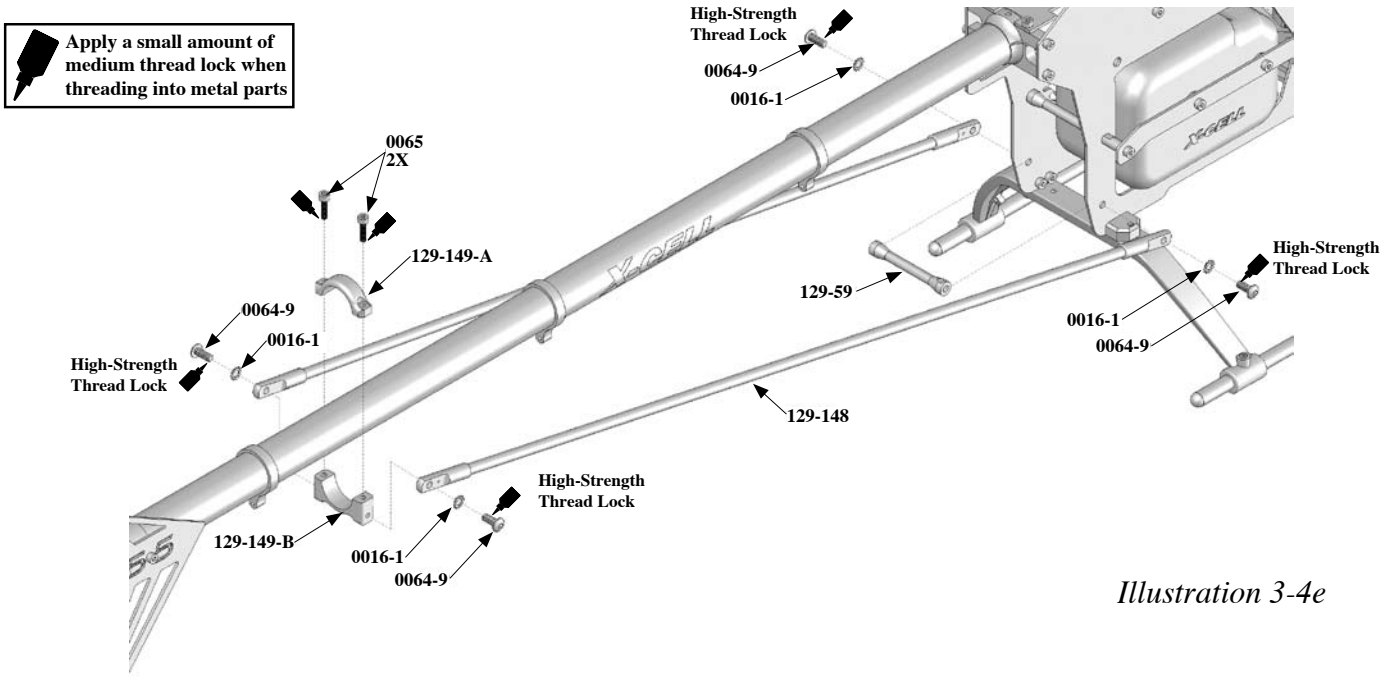


Illustration 3-4e

Locate the two MA128-148 boom support assemblies, MA128-149A upper boom support clamp, and MA128-149B lower boom support clamp, MA128-59 front boom support spacer, two MA0065 m3x12 socket bolts, four MA0064-9 m4x10 button head socket bolts, and four MA0016-1 external serrated lock washers. Refer to *Illustration 3-4e* for this step. Install the MA128-148 boom support assemblies to the main frame assembly (notice that the aluminum boom support ends have a dimple on one side. The dimple indicates a slight angle built in to this part. On the boom support assembly side that attaches to the main frame, the dimple will be facing "in") using two MA0064-9 m4x10 socket bolts, and two MA0016-1 external serrated lock washers per side. For added security of this part, we recommend using a "green" retaining compound such as MA3200-22 "super lock-green" on the MA0064-9 m4x10 socket bolts. Install the MA128-149 (A and B) onto the tail boom, and attach the boom support assemblies using two MA0064-9 m4x10 button head bolts, and two MA0016-1 external serrated lock washers per side. Take care to not overtighten the MA0065 m3x12 socket bolts, doing so may result in crushing the tail boom. Again, the use of "green" retaining compound is recommended on the MA0064-9 m4x10 button head bolts.

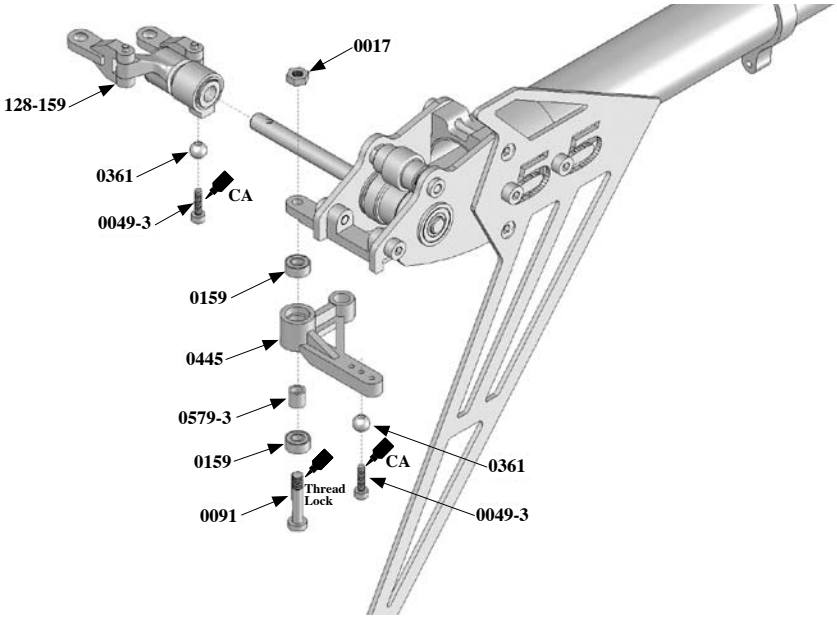


Illustration 3-4f

Locate the MA128-159 T/R pitch slider assembly, two MA0361 control balls, two MA0159 ball bearings, MA0445 plastic T/R bell crank, MA0579-3 brass spacer, two MA0049-3 m2x8 socket bolts, and one MA0017 hex nut. Refer to *Illustration 3-4f* for this step. Install an MA0361 control ball using an MA0049-3 m2x8 socket bolt into the middle hole of the MA0445 plastic T/R bell crank. It is recommended that you use a drop of CA (cyanoacrylate) on the threads of the MA0049-3 m2x8 socket bolt before threading the bolt into the plastic of the MA0445 plastic T/R bell crank. Insert an MA0159 ball bearing followed by the MA0579-3 brass spacer, and then the second MA0159 ball bearing. Install the bell crank to the aluminum bell crank mount using the MA0091 Phillips bolt. After the MA0091 Phillips bolt threads through the aluminum bell crank mount, use the MA0017 hex nut on the exposed threads of the bolt. Install an MA0361 control ball using a MA0049-3 socket bolt into the pitch slider assembly. It is recommended that you use a drop of CA (cyanoacrylate) on the threads of the MA0049-3 m2x8 socket bolt before threading the bolt into the plastic. Slide the MA128-159 pitch slider assembly onto the tail rotor shaft as shown in the illustration.

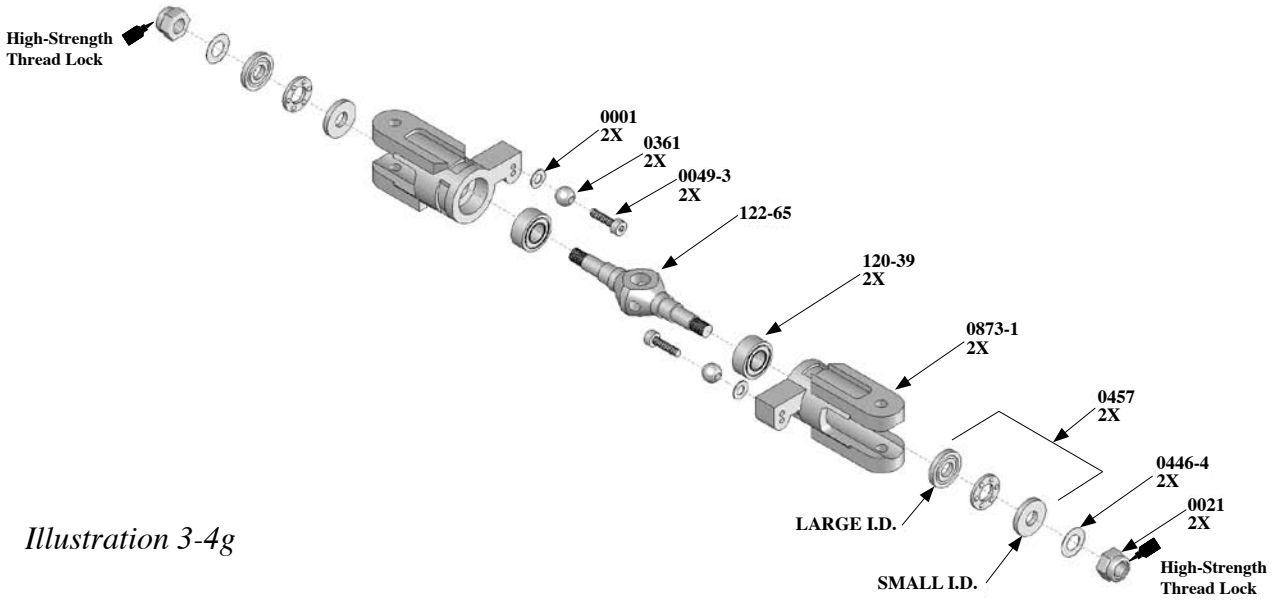
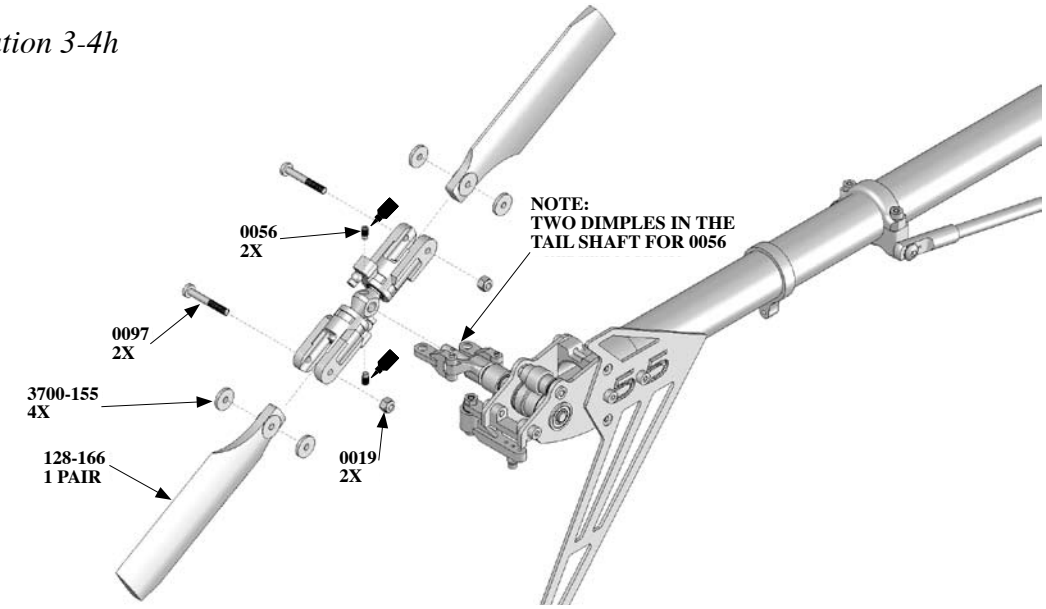


Illustration 3-4g

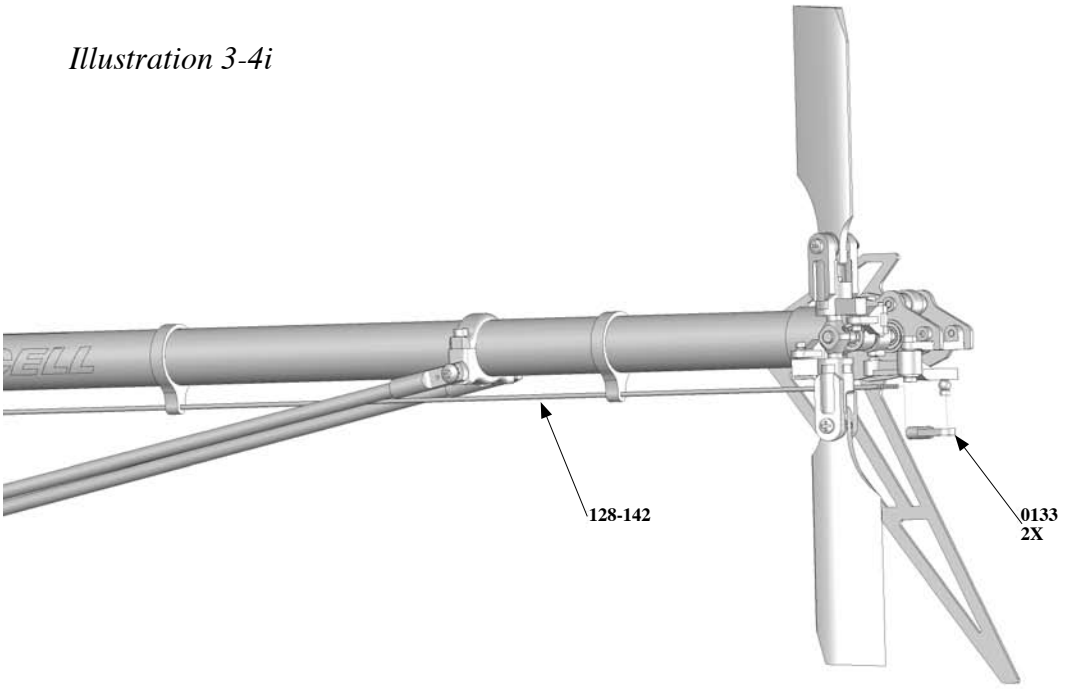
Locate the MA122-65 steel T/R hub, two MA0873-1 plastic T/R blade mounts, two MA120-39 ball bearings, two MA0457 thrust bearings, two MA0446-4 steel shims, two MA0361 control balls, two MA0001 washers, two MA0049-3 m2x8 socket bolts, and two MA0021 m4 lock nuts. Refer to *Illustration 3-4g* for this step. Use an MA0049-3 m2x8 socket bolt and an MA0001 washer to mount the MA0361 control ball to each plastic blade mount. Note that on each blade mount there are two mounting points for the control ball. For this model, the hole closest to the flat side of the T/R blade mount is correct. Push an MA120-39 ball bearing into each of the inner pockets of the MA0873-1 plastic T/R blade mount. Before installing the thrust bearing, you will need to determine which of the outer races has the larger inside diameter (I.D.) The outer race with the larger inside diameter will go in first. It is very important to grease the ball race of the thrust bearing. We suggest using Tri-Flow synthetic grease (MA3200-06). Pack the open side of the ball race with grease and install into the plastic T/R blade mount with the pocket facing in to keep the grease captured. Slide the outer race with the smaller I.D. into the plastic T/R blade mount, followed by the MA0446-4 steel shim. Hold the MA122-65 steel tail hub vertical, and gently slide on one completed T/R blade mount. We suggest using some "green" retaining compound such as MA3200-22 "super lock-green" applied to threads of the MA0021 m4 lock nut. The best way to apply this compound is with a very small amount on the tip of a toothpick. It is very important to not use too much retaining compound here, as getting any into the bearing or shims will result in unsatisfactory performance. We have found that the best way to tighten the MA0021 m4 lock nut is with a Wiha #265 7.0mm nut driver. Tighten the nut until a slight resistance is felt when rotating the grips, and then back the nut off until the grips rotate freely.

Illustration 3-4h



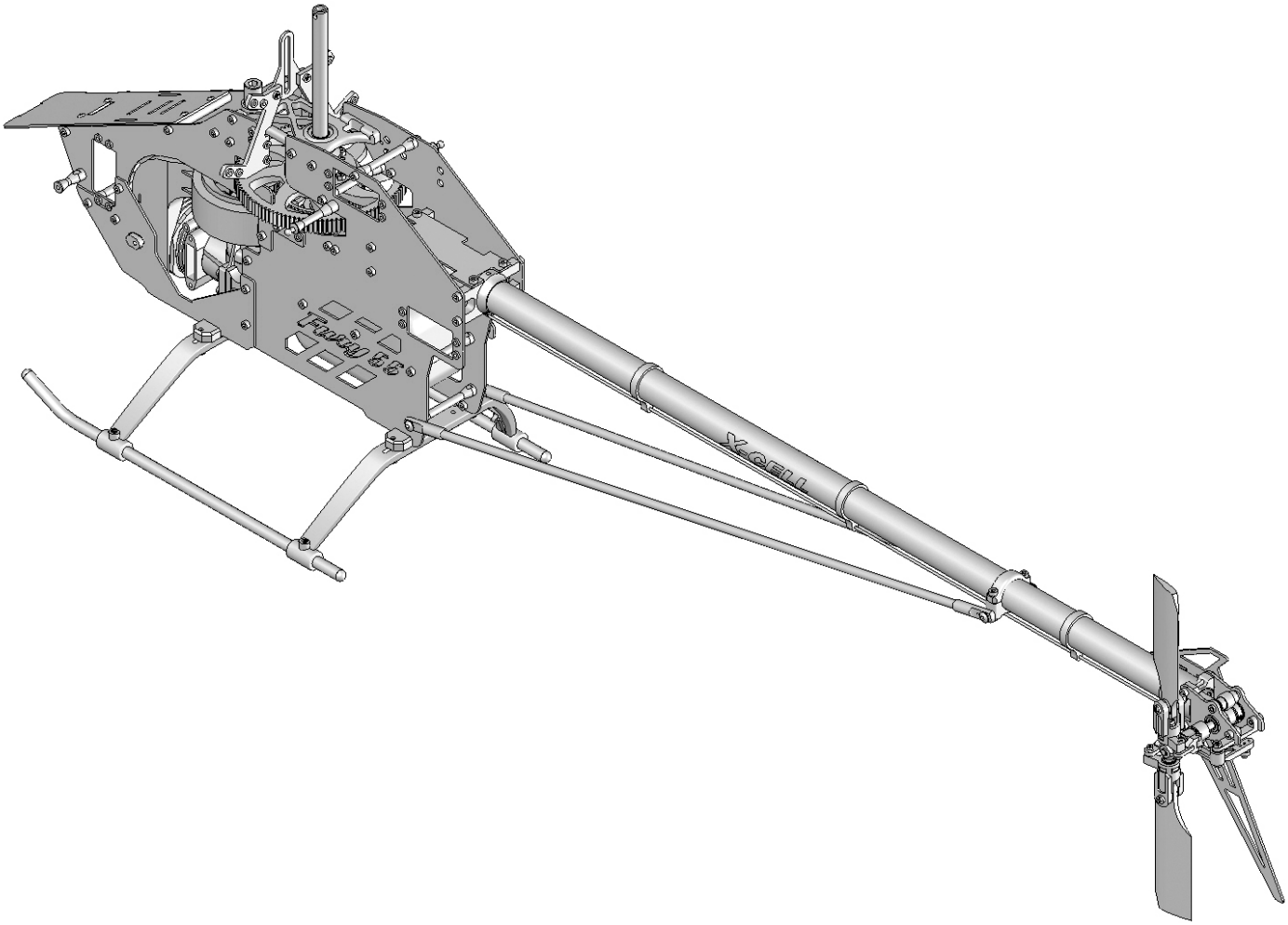
Locate two MA128-166 plastic T/R blades, four MA3700-155 1.5mm T/R blade mount spacers, two MA0097 Phillips bolts, two MA0019 m3 lock nuts, and two MA0056 m3x5 dog-point set screws. Refer to *Illustration 3-4h* for this step. Install the completed tail rotor hub assembly onto the tail rotor output shaft. Note there are two "dimples" on the T/R shaft. The MA0056 m3x5 dog-point set screws must engage the "dimple" on the T/R output shaft. Snap the pitch slider control links onto the MA0361 control balls on the plastic T/R blade mount. Install the plastic T/R blades using the MA3700-155 T/R blade mount spacers, an MA0097 Phillips bolt and an MA0019 m3 lock nut. These bolts should be tightened until the T/R blade can no longer "fall" under its own weight.

Illustration 3-4i

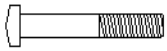


Locate the MA128-142 T/R control rod, and two MA0133 ball links. Refer to *Illustration 3-4i* for this step. Thread one of the MA0133 ball links onto the MA128-142 T/R control rod. Slide the T/R control rod through all three of the T/R control rod guides. Make sure they are aligned so that there are no bends in the T/R control rod. Thread on the other MA0133 ball link. It is important to align the T/R control rod guides so that they are positioned approximately 152mm from the ball links. Simply position the center T/R control rod guide evenly between the two outer T/R control rod guides.

Bag 3–4 Completed Assembly



Bag 5 Hardware

	0015	m2 Hex Nut
	0051	m3 x 3 Socket Set Screw
	0038	m2.5 x 10 Phillips Bolt
	0039-2	m2.5 x 16 Phillips Bolt
	0067	m3 x 14 Socket Bolt
	0095	m3 x 19 Phillips Bolt
	0447-1	m1.5 E-Clips

Bag 5

Locate bag 5, and the hardware for bag 5. Please take the time to identify the hardware for this bag.

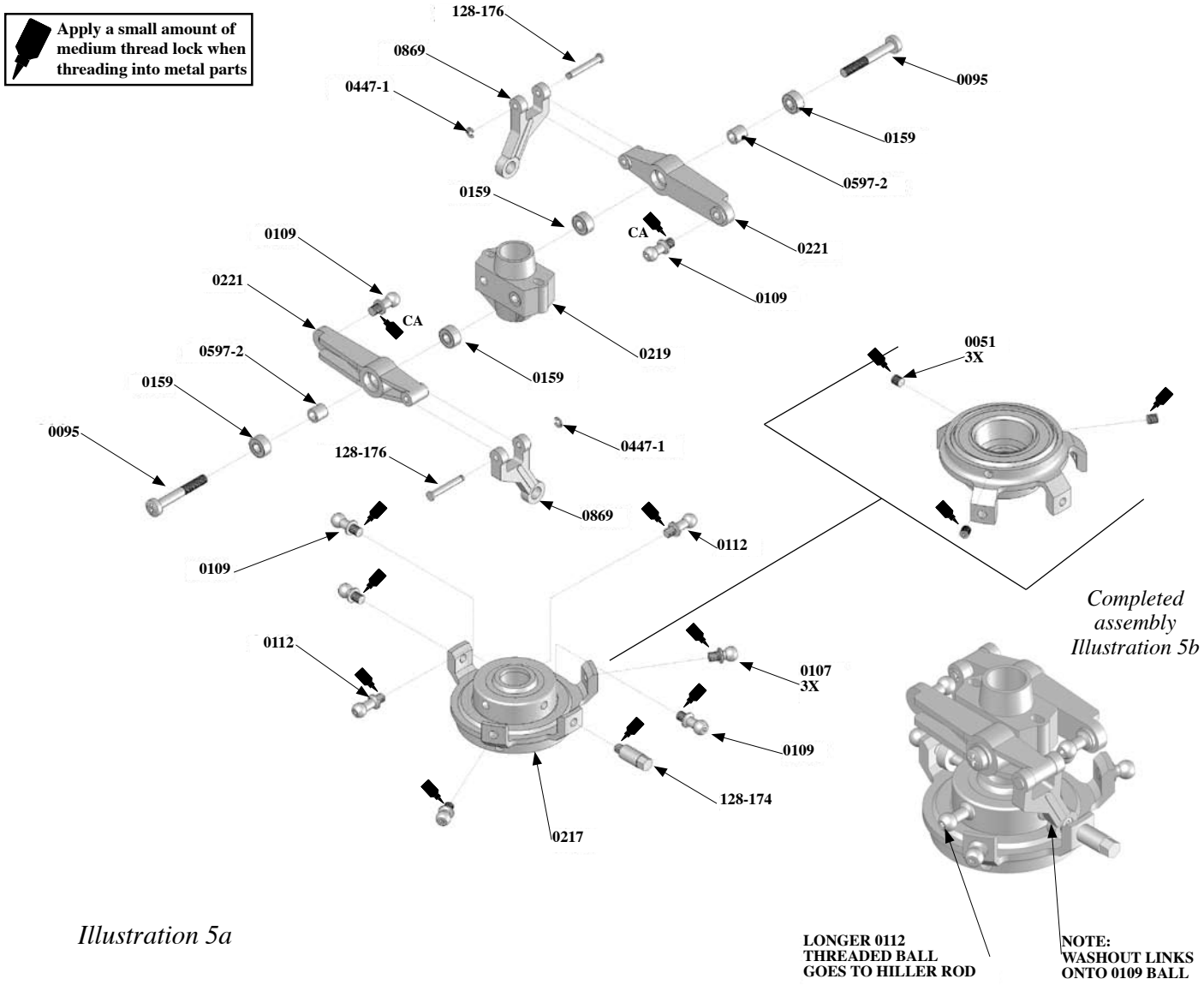


Illustration 5a

Locate two MA0869 plastic washout links, two MA128-176 washout pivot pins, two MA0221 plastic washout arms, MA0219 plastic washout hub, four MA0159 ball bearings, two MA0597-2 brass spacers, two MA0112 m3x9.5 threaded control balls, four MA0109 m3x8 threaded control balls, three MA0107 m3x6 threaded control balls, MA0217 swashplate, MA128-174 swashplate guide pin, two MA0095 m3x19 Phillips bolts, two MA0447-1 m1.5 E-clips, and two MA0051 m3x3 socket set screws. Refer to *Illustrations 5a* and *5b* for this step. Please take care to note the difference in sizes between the threaded control balls. There are three sizes, and it is very important they are used in the correct locations. Note these locations in the drawing. On the inner ring of the swashplate, thread in two MA0112 m3x9.5 threaded control balls, directly across from one another, and two MA0109 m3x8 threaded control balls directly across from one another. On the outer ring of the swashplate, thread in three MA0107 m3x6 threaded control balls. Thread in the MA0051 m3x3 socket set screws into the base of the swashplate only until they bottom out against the lower bearing. They are only used to apply slight pressure on the bearing to remove any play associated with bearing wear. If too much pressure is applied with the MA0051 m3x3 socket set screws, the bearing will feel "notchy" and the set screws need to be loosened slightly. Thread in the MA128-174 swashplate guide pin into the outer ring of the swashplate. Apply a small amount of medium CA (cyanoacrylate) to the threads of the MA0109 m3x8 threaded control ball, and thread the MA0109 m3x8 threaded control balls into each washout arm. Press an MA128-176 washout pivot pin into the MA0869 plastic washout link, through the MA0221 plastic washout arm. This step can be tricky, as the pin is designed to be tight to reduce excess play (slop). Please take careful note of the orientation of this part as shown in the illustration. If the link does not move freely, it is recommended that you apply heat from a heat gun to the washout arm assembly, but care must be taken to not overheat the plastic parts. Attach an MA0447-1 m1.5 E-clip onto the groove machined into the MA128-176 pivot pin. Push an MA0159 ball bearing into one side of each MA0221 washout arm. Place an MA0597-2 brass spacer into the washout arm, followed by a second MA0159 ball bearing. Use an MA0095 m3x19 Phillips bolt to attach the complete washout arm onto the MA0219 washout hub. Note there is a "ridge" molded into one of the holes on each side of the MA0219 washout base. This "ridge" is designed to provide the proper spacing between the washout arm and washout base. The completed washout assembly sits on top of the completed swashplate assembly, as shown in *Illustration 5b*. Please note that the MA0869 plastic washout links snap onto the shorter MA0109 m3x8 threaded control balls.

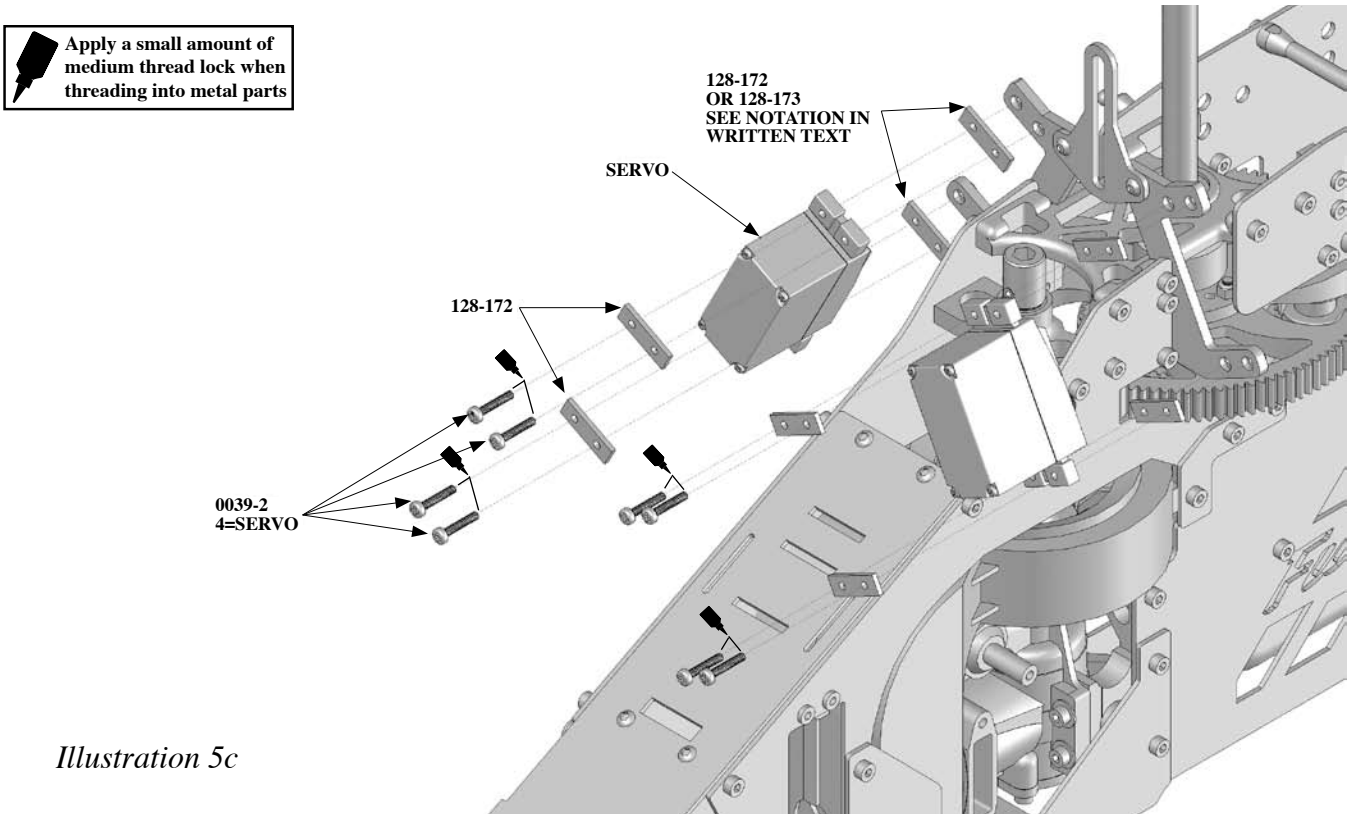


Illustration 5c

Locate the MA128-172 G-10 servo retainers, the carbon fiber cyclic servo spacers, eight MA0039-2 m2.5x16 Phillips bolts, and two of the servos you have chosen for cyclic control of the swashplate. Please refer to *Illustration 5c* for this step. Miniature Aircraft USA realizes that there are many different brands and models of servos available, and many have slightly different servo arm heights. We have included the spacers required for proper alignment of the control rod for nearly any servo available. Using the MA0039-2 m2.5x16 Phillips bolts and MA128-172 G-10 spacers OR MA128-173 carbon fiber spacers mount the left and right cyclic servos as shown in the illustration. Do not mount the servo arms to the servos at this time. There already are PEM nuts pressed into the cyclic servo mounts for this purpose. NOTE: you may have to change the servos spacers in a later step to insure proper alignment of the control rod.

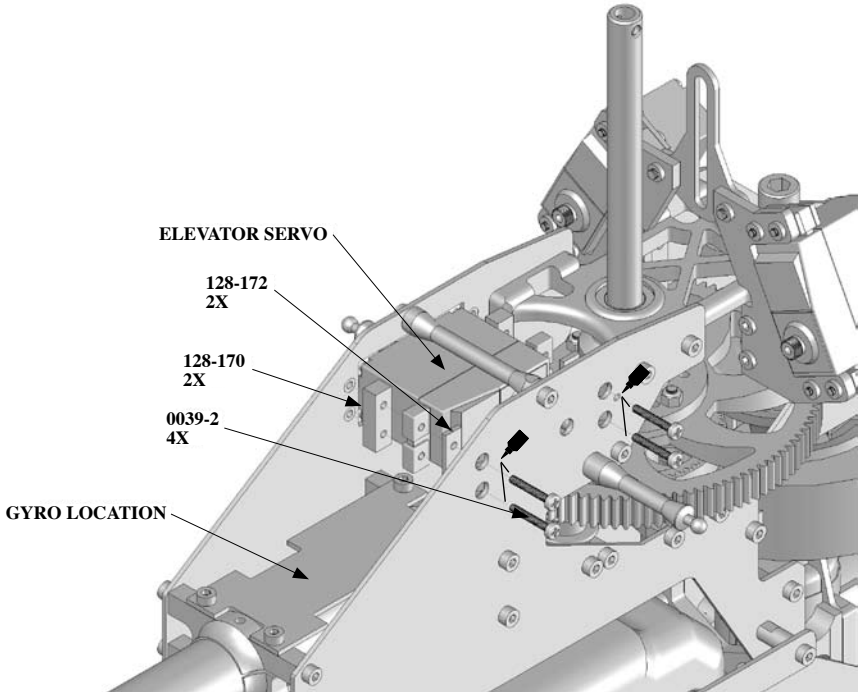


Illustration 5d

Locate two MA128-170 plastic servo blocks, the MA128-172 G-10 servo retainers, four MA0039-2 m2.5x16 Phillips bolts, and one more cyclic servo. Refer to *Illustration 5d* for this step. Using the MA128-170 plastic servo blocks, the MA128-172 G-10 servo retainers and the MA0039-2 m2.5x16 Phillips bolts, mount the servo into the frame as shown in the illustration. There already are PEM nuts pressed into the frame for this purpose. NOTE: you may have to change the servos spacers in a later step to insure proper alignment of the control rod.

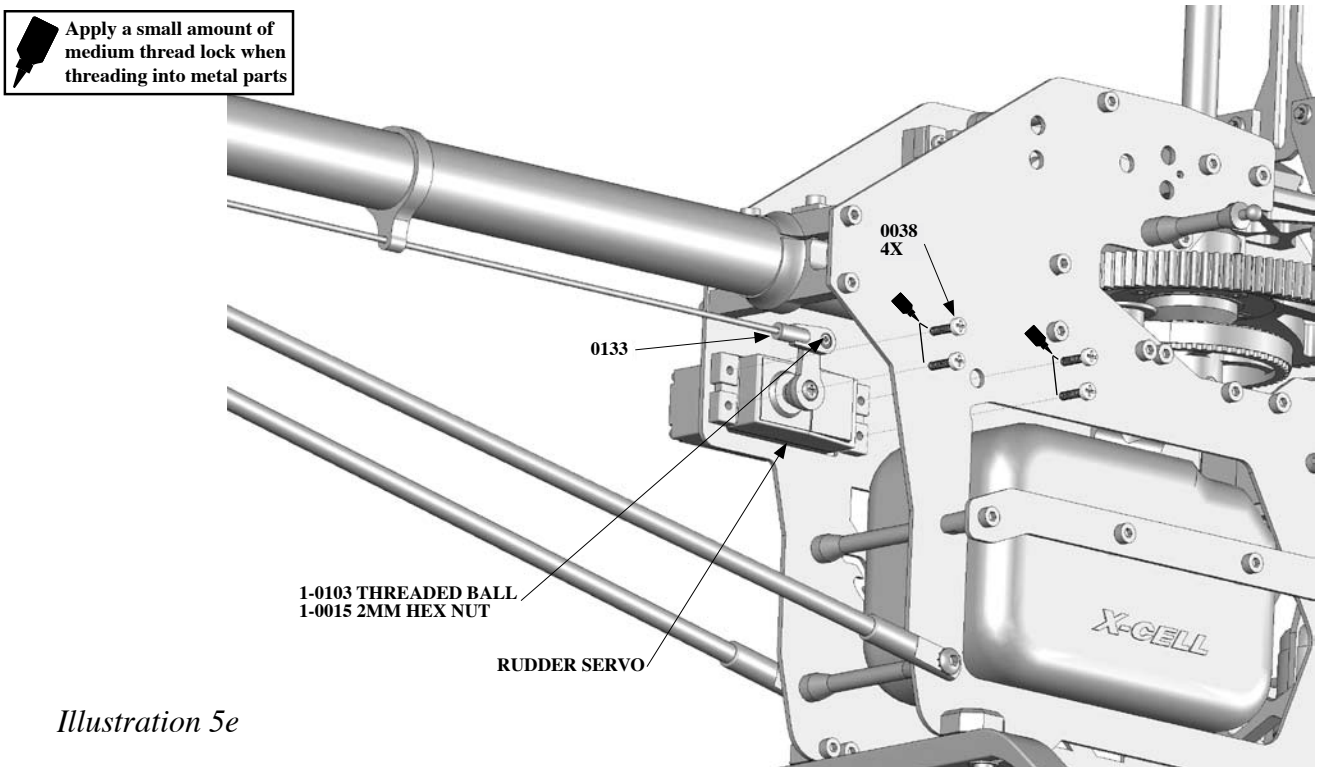


Illustration 5e

Locate an MA0103 m2x5 threaded ball, an MA0015 m2 hex nut, four MA0038 m2.5x10 Phillips bolts, and the servo you have chosen to control the tail rotor. Refer to *Illustration 5e* for this step. Mount the MA0103 m2x5 threaded ball into the servo horn 14-15mm from the center of the horn and use an MA0015 m2 hex nut to secure the threaded ball to the servo horn. Use four MA0038 m2.5x10 Phillips bolts to mount the tail rotor servo to the frame. PEM nuts are already installed in the frame for this purpose.

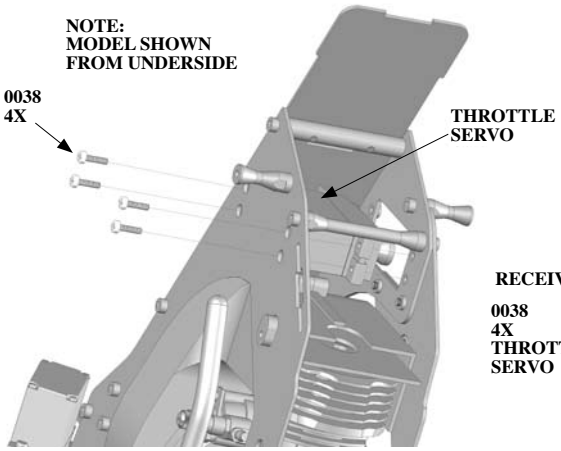


Illustration 5f.1

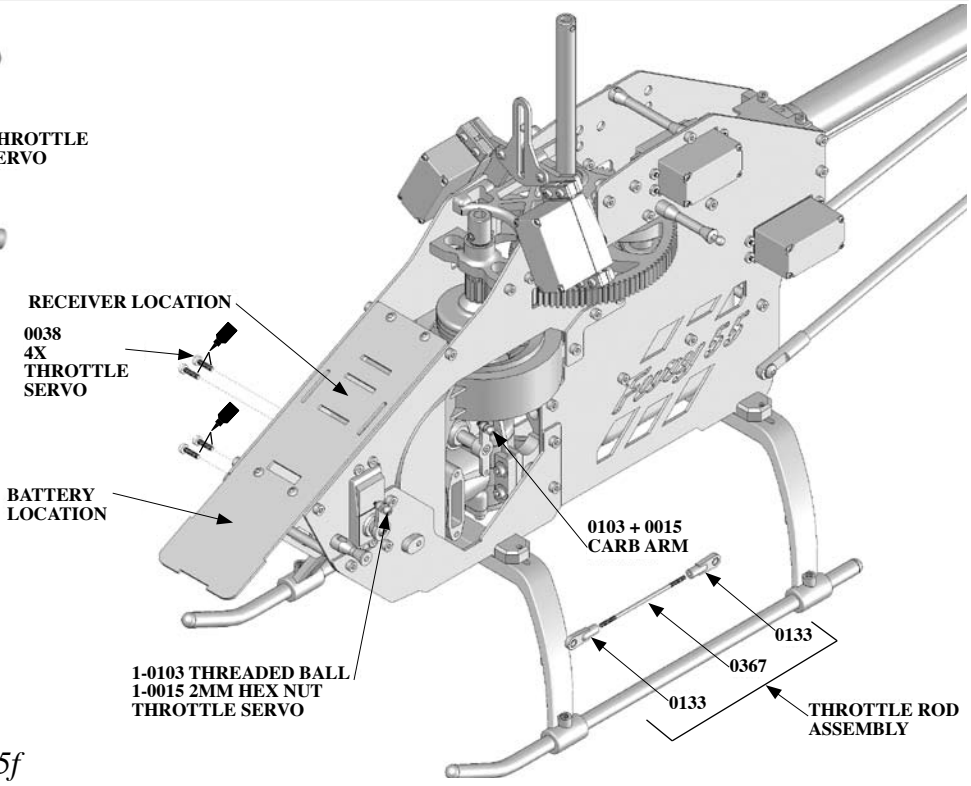
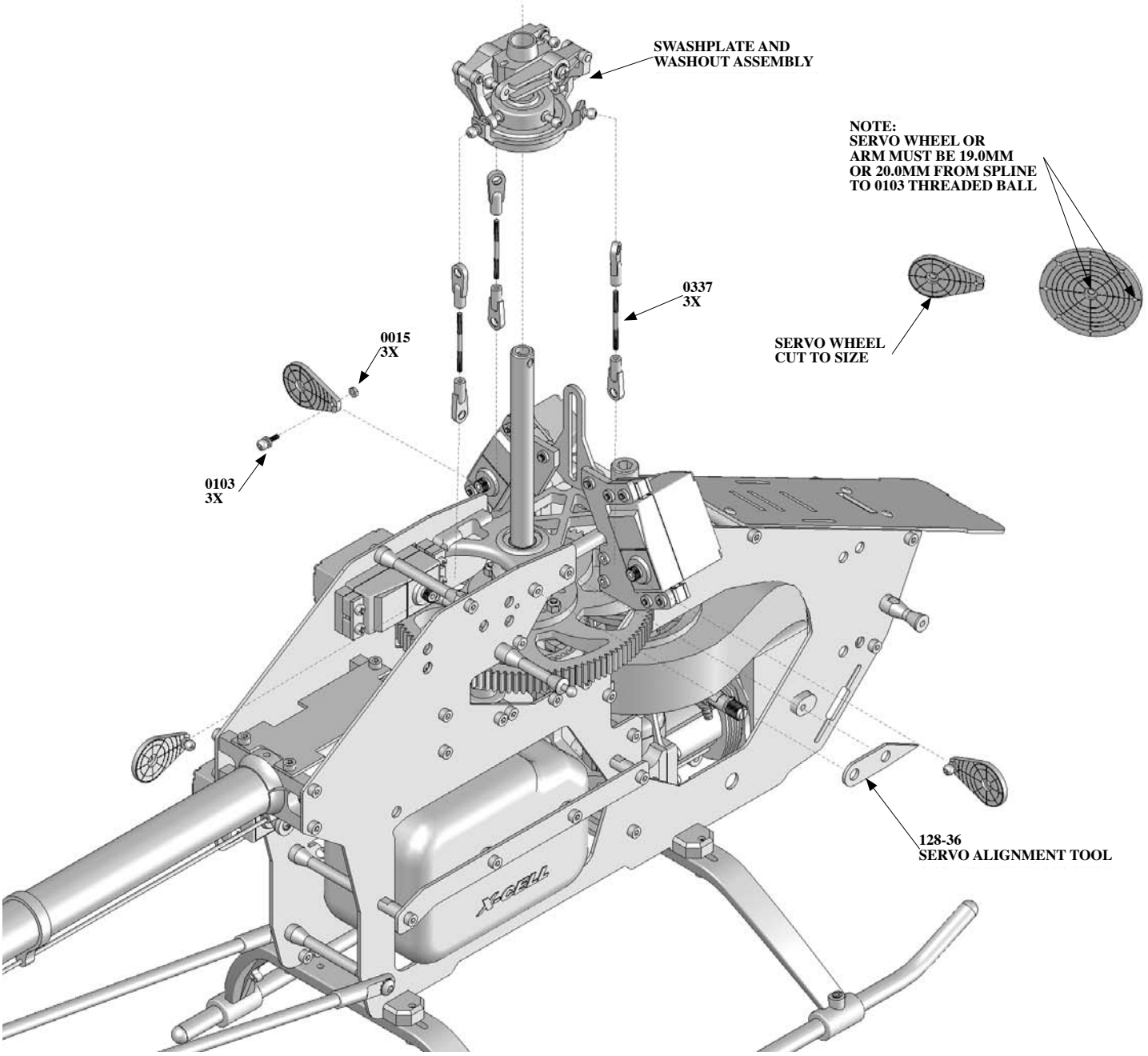


Illustration 5f

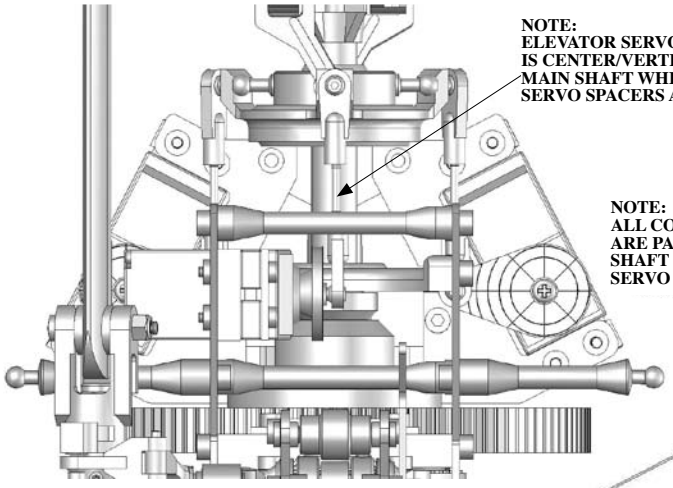
Locate MA0367 threaded control rod, two MA0133 plastic ball links, MA0103 m2x5 threaded ball, MA0012 hex nut, four MA0038 m2.5x10 Phillips bolts, and the servo you have chosen for the throttle. Refer to *Illustration 5f and 5f.1* for this step. Mount the throttle servo on the INSIDE of the frame using the four MA0038 m2.5x10 Phillips bolts. Thread the two MA0133 plastic ball links onto the MA0367 threaded control rod. This rod should be made so that approx. 45mm of threaded control rod is visible between the ball studs. See page 44 for control rod lengths. Illustration 5f also shows suggested mounting points for the receiver and receiver battery. It is usually best to mount the receiver battery in the forward most position on the tray to achieve proper center of gravity for the model. Refer to page 42 for a diagram of the suggested receiver and battery locations.

Illustration 5g



Locate six MA0133 plastic ball links, three MA0337 threaded control rods, MA128-36 servo alignment tool, three MA0103 m2x5 threaded control balls, three MA0015 m2 hex nuts, the servo horns you have chosen for your cyclic servos, and the swashplate and washout assembly you built in the first step of this bag. It is important to "center" your servos before mounting the servo horn. A simple tool has been provided to help you center the right and left cyclic servo, and a small hole in the frame to sight the exact center of the threaded control ball for the elevator servo. Place the MA128-36 servo alignment tool onto the socket bolt heads located above the main gear as shown in the illustration. When the MA128-36 servo alignment tool simply snaps over the socket bolt heads, the tip of the servo alignment tool will point to the exact location of where the center of the threaded control needs to be. To properly center the servos, you must power on your transmitter and receiver and place the collective stick of your transmitter in the center. Now fit the servo horn. With some brand's servo horns you have the option of trimming the horn to the exact shape needed, and drilling the hole for the control ball at the precise location. A suggestion for trimming the shape of a servo "wheel" is shown in the illustration. Other brand's servo horns you only have a couple options depending on how many sides the servo horn has. On the Fury 55 it is very important to mount the threaded control ball 19-20mm from the center of the servo spline. After you have determined where to mount the control ball on the horn, do so using an MA0015 m2 hex nut on the threads of the control ball. Thread the six MA0133 plastic ball links onto the MA0337 threaded control rods. Make all three linkages so that approximately 9.25mm of threaded control rod is visible in length between the MA0133 plastic ball links. See page 44 for control rod lengths. Slide the swashplate, and washout assembly onto the mainshaft, and insure that the guide pin is inside the slot of the anti-rotation guide.

Illustration 5i



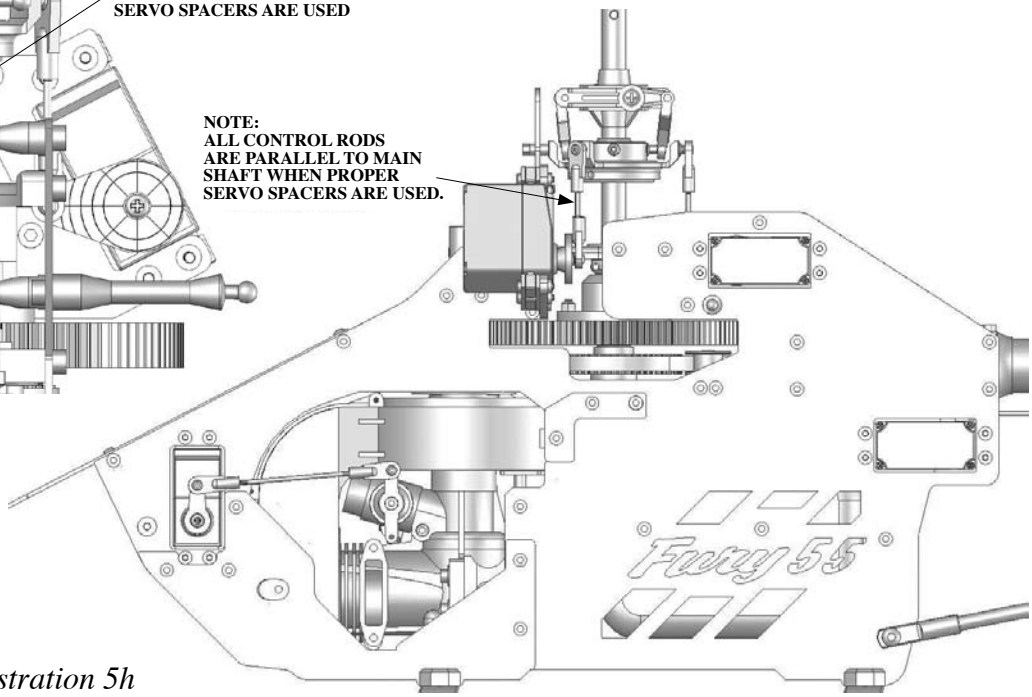


Illustration 5h

Illustrations 5h and *5i* show the control rods parallel to the main shaft. It is important that these control rods are parallel to the main shaft. This can be adjusted using the spacers provided and discussed and shown in illustration 5c and 5d. Also shown in *Illustration 5h* is the throttle linkage, it is important that the linkage for the throttle is 90 degrees from the linkage when the throttle is at 50%, or as indicated in the manual for the engine you are using.

Illustration 5j

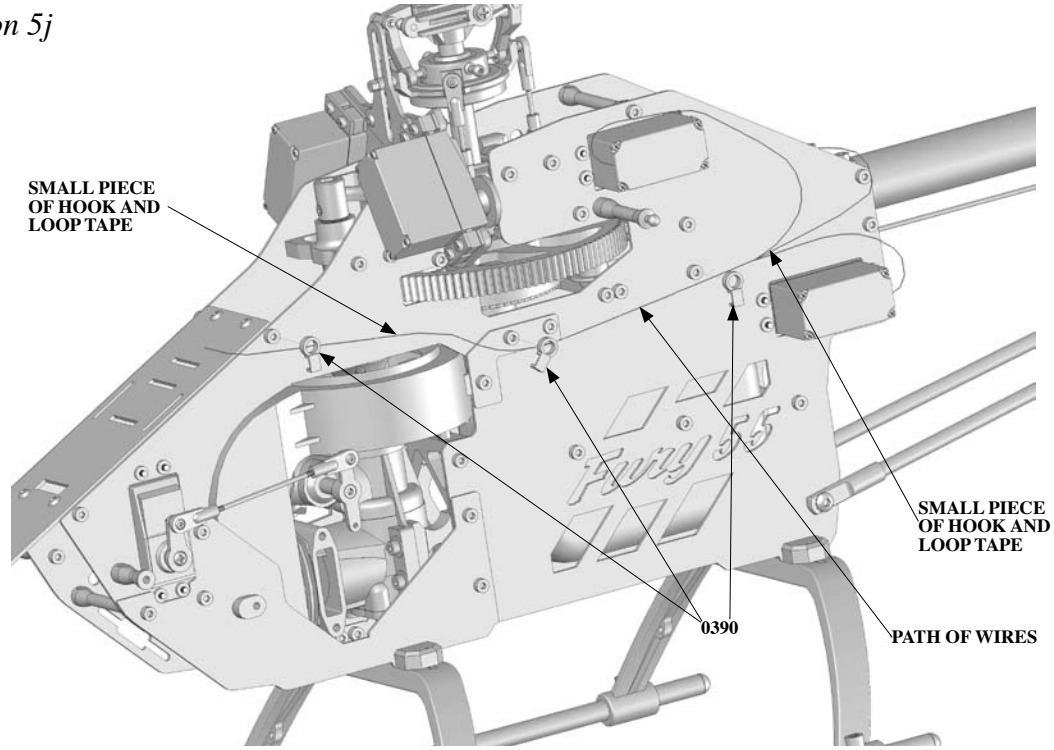


Illustration 5j shows a suggestion for mounting the wires for the gyro, rudder servo, and elevator servo. Three MA0390 wire retainers have been provided to help make your wiring job easier. Also included is some hook and loop fastening tape which can be cut into short lengths to gather the wires together.

Illustration 5k

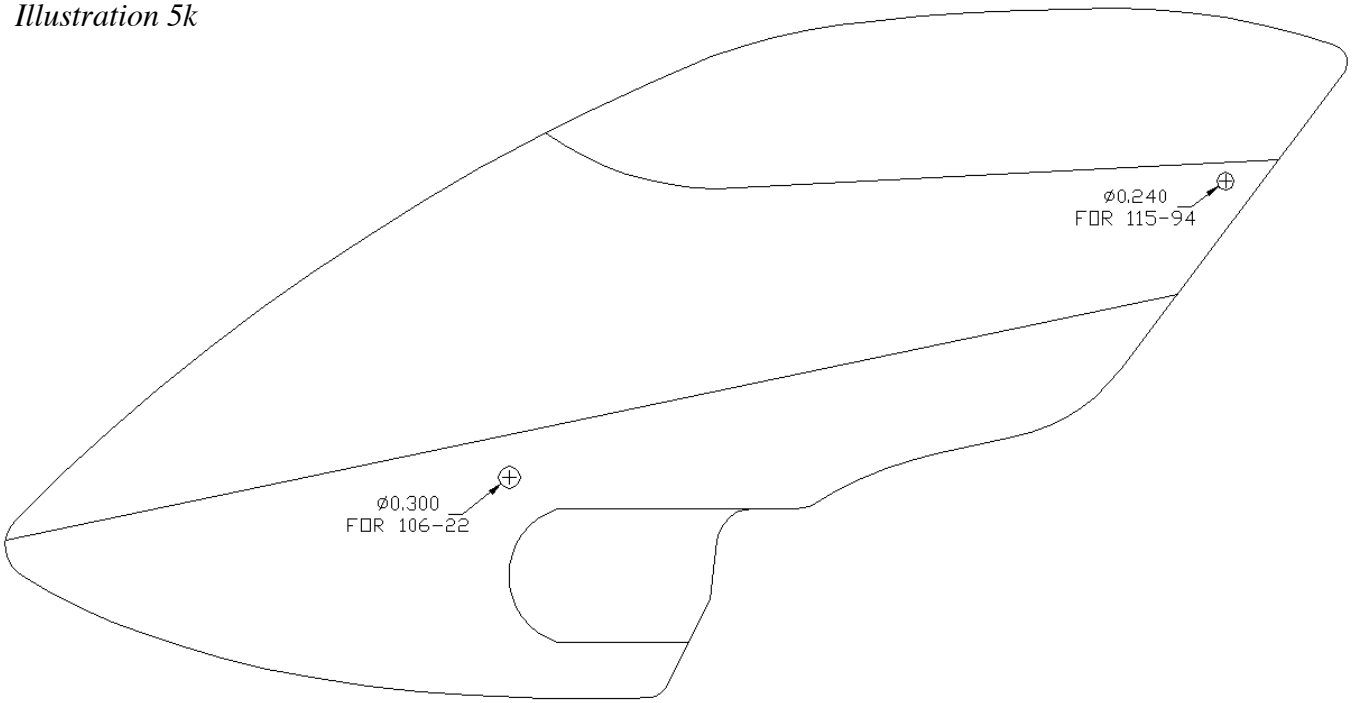
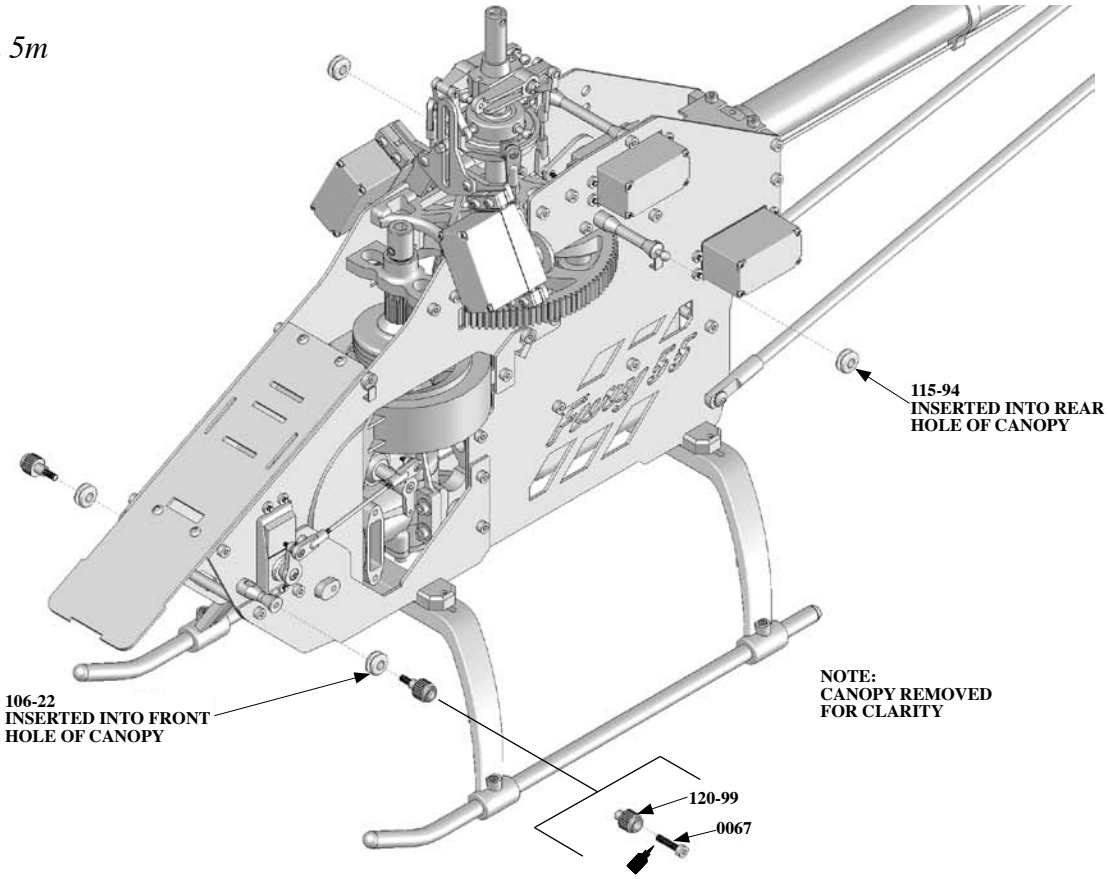


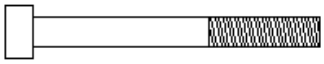
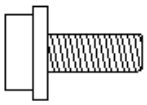
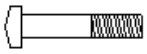
Illustration 5k shows the location of the holes for the canopy mounting grommets. It is first suggested that a 3mm hole be drilled in the front dimples to test fit the canopy. You can then determine if the rear holes require adjusting placement before opening the hole to the final grommet size. Once the location of the holes is verified, ream the holes out to their final size of 0.300" for the front, and 0.240".

Illustration 5m

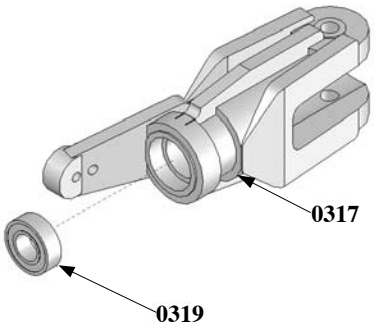


Locate two MA120-99 canopy knobs, two MA0067 m3x14 socket bolts, two MA106-22 rubber canopy grommets, and two MA115-94 rubber canopy grommets. Refer to *Illustration 5l* for this step. The larger MA106-22 rubber canopy grommets are used in the front, and the smaller MA115-94 grommets are used in the rear. It is recommended to use a small amount of CA (cyanoacrylate) to secure the grommets to the canopy. Thread the MA0067 m3x14 socket bolt into the MA120-99 canopy knob. It is important to use just a bit of thread locking compound on the MA0067 m3x14 only near the head of this bolt, simply to hold the canopy knob onto the bolt.

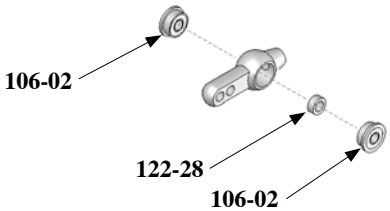
Bag 6 Hardware

	0021	m4 Lock Nut
	0053-3	m3 x 16 Socket Set Screw
	0057	m4 x 4 Socket Set Screw
	0063	m3 x 10 Socket Bolt
	0064-3	m3 x 6 Button Head Socket Bolt
	0067	m3 x 14 Socket Bolt
	0082	m4 x 38 Socket Bolt
	0086	m5 x 12 Flanged Socket Bolt
	0091	m3 x 16 Phillips Bolt

Bags 6 Parts Pre-Assembled from Factory

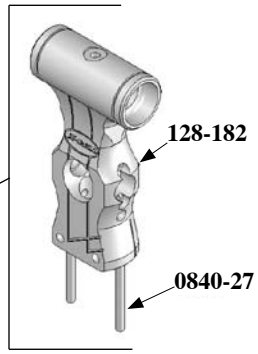


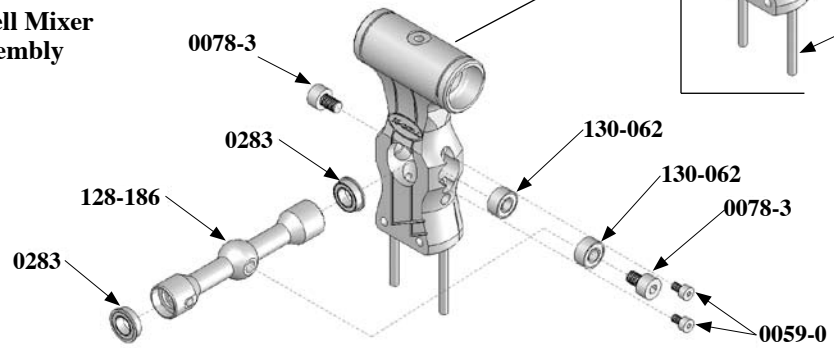
128-188
Main Blade Grips



128-196
3-D Bell Mixer Assembly

128-180
Head Block Assembly



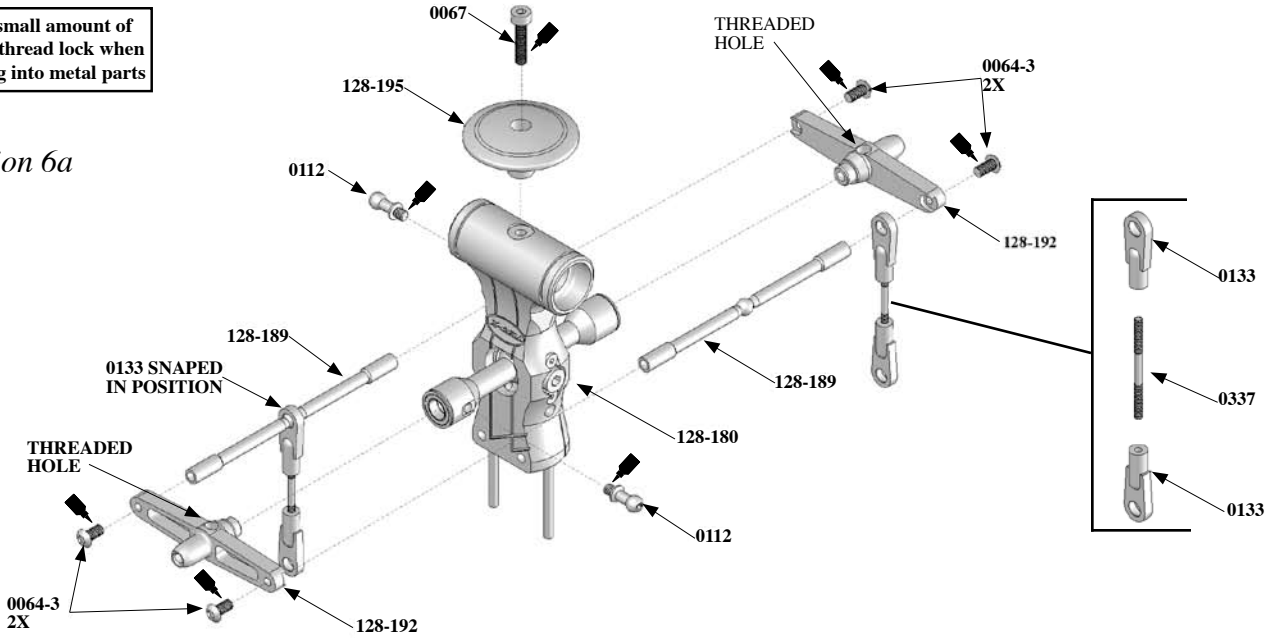


Bag 6

Locate bag 6, and the hardware for bag 6. Please take the time to identify the hardware for this bag.

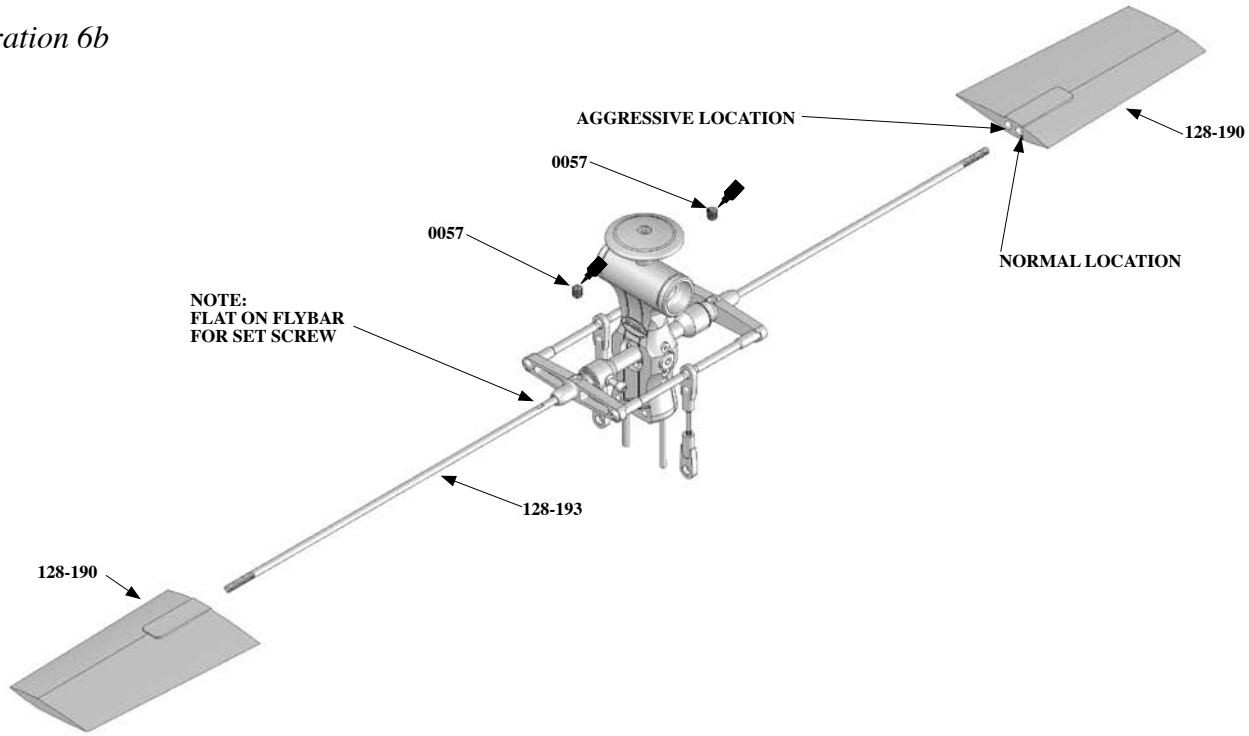
Apply a small amount of medium thread lock when threading into metal parts

Illustration 6a



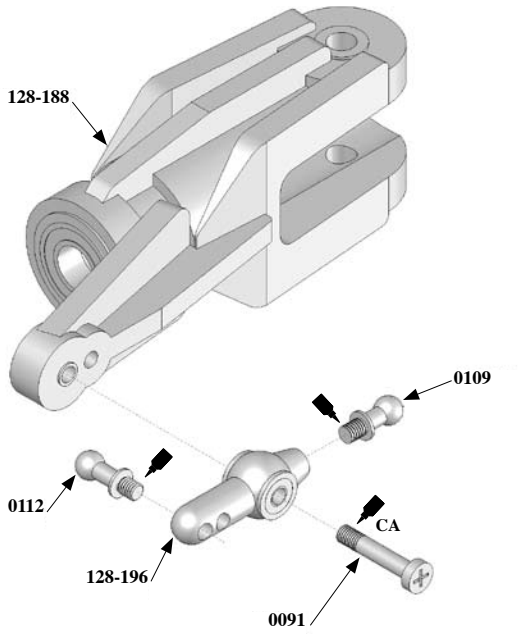
Locate the MA128-180 head block assembly, MA128-195 head button, two MA128-192 flybar control arms, two MA128-189 flybar control bar, four MA0133 ball links, two MA0337 m2x30 threaded control rods, two MA0112 m3x9.5 threaded control balls, four MA0064-3 m3x6 button head socket bolts, and one MA0067 m3x14 socket bolt. Refer to *Illustration 6a* for this step. Thread the four MA0331 ball links onto the two MA0337 m3x30 threaded control rod. These control rods should be made so that 13.75mm of threaded control rod is visible between the ball links. See page 44 for control rod lengths. Snap each completed control rods onto the MA128-189 flybar control bar. Thread the MA0064-3 m3x6 button head socket bolts through the MA128-192 flybar control arms and into each MA128-189 flybar control bar. The MA128-192 flybar control bar fits into the bearing of the seesaw, note that the threaded holes on the MA128-192 flybar control bars should be facing "up". Thread the two MA0112 m3x9.5 threaded control balls into the seesaw. Install the head button using the MA0067 m3x14 socket bolt.

Illustration 6b



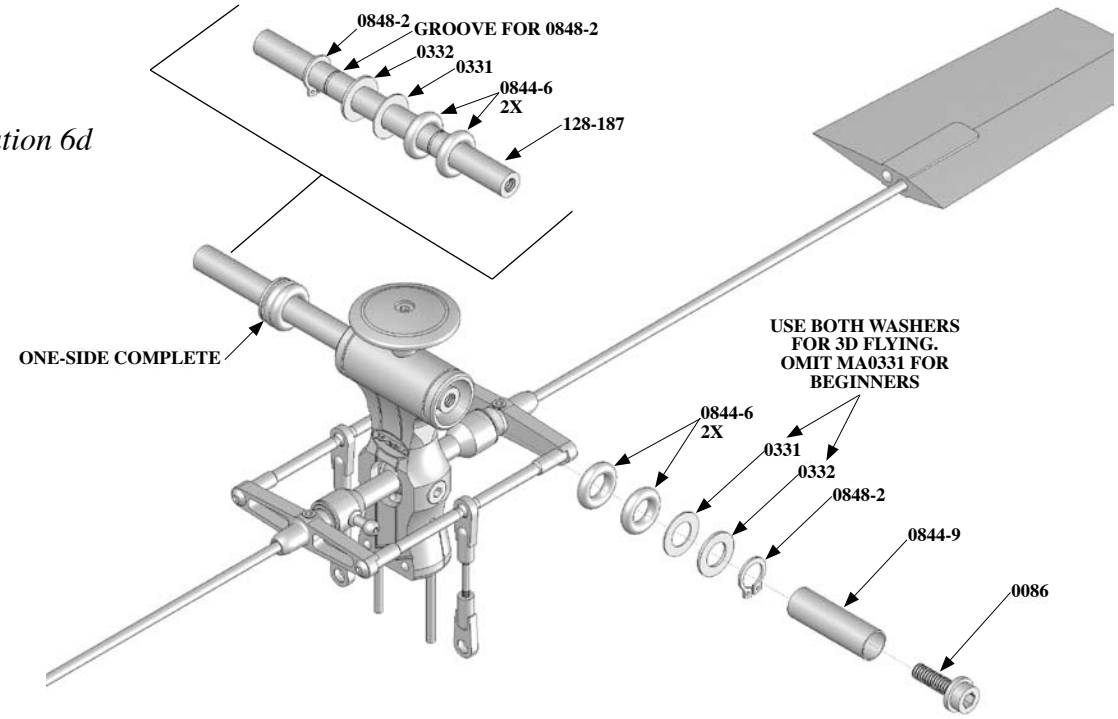
Locate the MA128-192 flybar from bag 4, two MA128-190 flybar paddles, and two MA0057 m4x4 socket set screws. Refer to *Illustration 6b* for this step. Note the two flat spots on the MA128-193 flybar. They are used to locate the flybar correctly in the flybar control assembly. Slide the MA128-193 flybar into the flybar control assembly and thread in the two MA0057 m4x4 socket set screws into the flybar assembly, ensuring the set screws are tightened onto the flat spots. Place a drop of medium CA (cyanoacrylate) on the flybar threads. Thread on the MA128-190 flybar paddles onto the flybar until the threads are no longer visible, ensuring the paddles are parallel with one another. the distance between the flybar paddle and the flybar control arm must be the same for each side.

Illustration 6c



Locate two MA128-188 main blade grips w/0319 bearings, two MA128-196 3-D bell mixer assemblies, two MA0112 m3x9.5 threaded control balls, two MA0109 m3x8 threaded control balls, and two MA0091 m3x16 Phillips bolts. Refer to *Illustration 6c* for this step. Thread the MA0112 m3x9.5 threaded control balls into the OUTER holes on the MA128-196 3-D bell mixers. Note there is an inner hole, for the Fury 55 application we do not recommend installing the MA0112 m3x9.5 threaded control ball in this location. Mounting the MA0112 m3x9.5 threaded control ball on the inner hole on the Fury 55 may result in the binding and/or failure of the MA0133-1 ball link. Thread the MA0109 m3x8 threaded control balls into the opposite side of each MA128-196 3-D bell mixer. Slide the MA0091 m3x16 Phillips bolt through each bell mixer, and apply a small amount of medium CA (cyanoacrylate) to the threads of the bolt, then thread the bolt into the hole on the blade grip as shown. It is important to thread the MA0091 Phillips bolts into the correct hole on the blade grip for proper rotor head geometry.

Illustration 6d



Locate the MA128-187 8mm head axle, four MA0844 90d head damper O-rings, two MA0331 m8x14x0.5 shim washers, two MA0332 m8x14x1 shim washers, two MA0848-2 m8 retaining clips, two MA0086 m5x12 flanged socket bolts, and the MA0844-9 clip application tool. Refer to *Illustration 6d* for this step. Use retaining clip pliers (snap ring pliers) to install one of the MA0848-2 m8 retaining clips into the groove on the MA128-187 8m head axle. Slip on the MA0332 m8x14x1 shim washer, then the MA0331 m8x14x0.5 shim washer, then two MA0844-6 90d head damper O-rings. Miniature Aircraft USA recommends the use of both thick and thin shim washers for 3D flying. If you are a beginner, you may choose to omit the use of the MA0331 m8x14x0.5 shim washers. The result will be a model with a more stable hover and flight characteristic especially at lower head speeds. Slide the head axle with shims and dampers into the head block. Now slip the other two MA0844-6 90d head damper O-rings, MA0331 m8x14x0.5 shim washer (if you choose to prepare the model for 3D flying), and the MA0332 m8x14x1 shim washer. Thread in (do not use thread locking compound yet) an MA0086 m5x12 flanged socket bolt into the side of the axle where the MA0848-2 retaining clip was installed. Slide on the MA0844-9 clip application tool onto the other side of the head axle, and thread in (do not use thread locking compound yet) the other MA0086 m5x12 flanged socket bolt. Use a 4mm hex driver to hold one of MA0086 m5x12 flanged socket bolts, and tighten the other until you feel a “click”. The clip application tool presses the MA0848-2 retaining clip into the groove. After the MA0848-2 m8 retaining clip is seated into the groove, remove the two MA0086 m5x12 flanged socket bolts and set them aside for the next step.

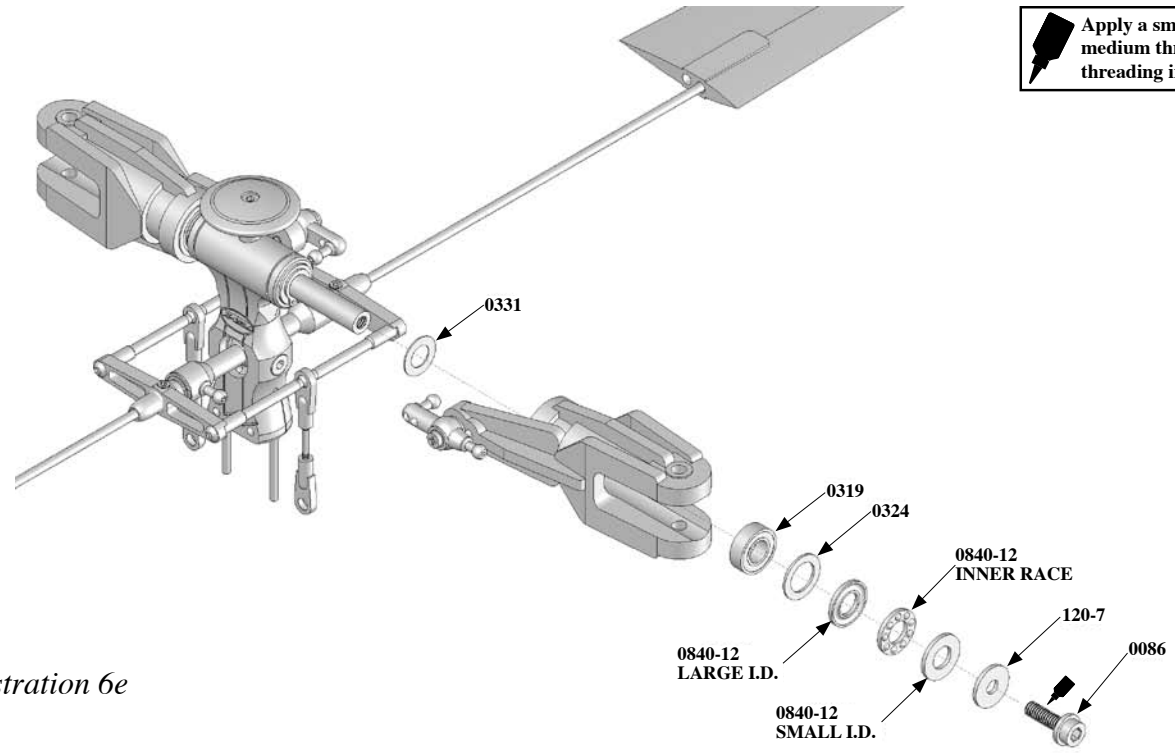


Illustration 6e

Locate two MA0331 m8x14x0.5 shim washers, two MA0319 m8x16x5 ball bearings, two MA0324 m10.75x16x1 shim washers, two MA0840-12 thrust bearings, two MA120-7 m5x5.5 C/F washer, and the two MA0086 m5x12 flanged socket bolts from the previous step. Refer to *Illustration 6e* for this step. In this step, you will complete two main rotor grip assemblies. Prepare the MA0840-12 thrust bearing by applying grease (MA3200-06 synthetic grease) to the inside pocket of the inner ball race. Push the MA0319 m8x16x5 ball bearing into the blade grip, followed by the MA0324 m10.75x16x1 shim, then the MA0840-12 thrust bearing. NOTE: install the outer race with the larger inside diameter (I.D), then the greased inner race, and then the outer race with the smaller inside diameter (I.D). Finish with MA120-7 m5x5.5 C/F washer, and the MA0086 m5x12 flanged socket bolt.

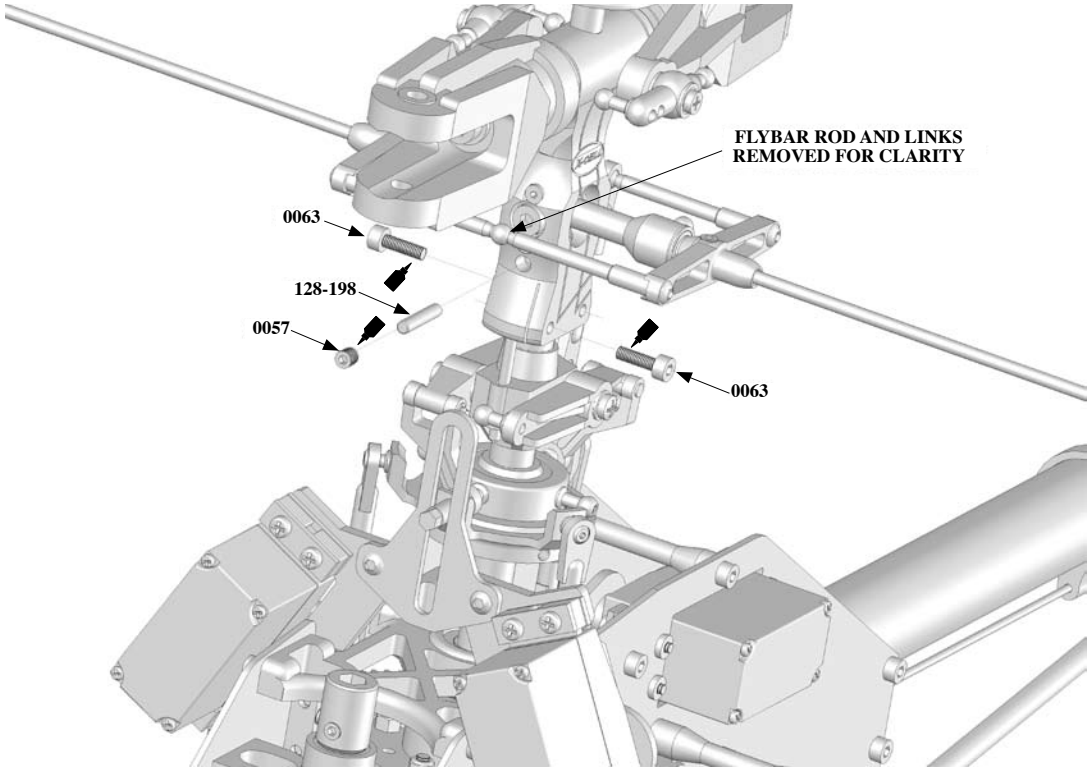


Illustration 6f

Locate MA128-198 m3x16 dowel pin, two MA0063 m3x10 socket bolts, and one MA0057 m4x4 socket set screw. Refer to *Illustration 6f* for this step. Slide the previously completed rotorhead onto the main shaft. Line up the alignment hole on the rotor head with the hole in the main shaft, and slide the MA128-198 dowel pin through. Thread in and tighten the MA0057 m4x4 socket set screw in after the dowel pin. Thread in the MA0063 m3x10 socket bolts into either side, and tighten.

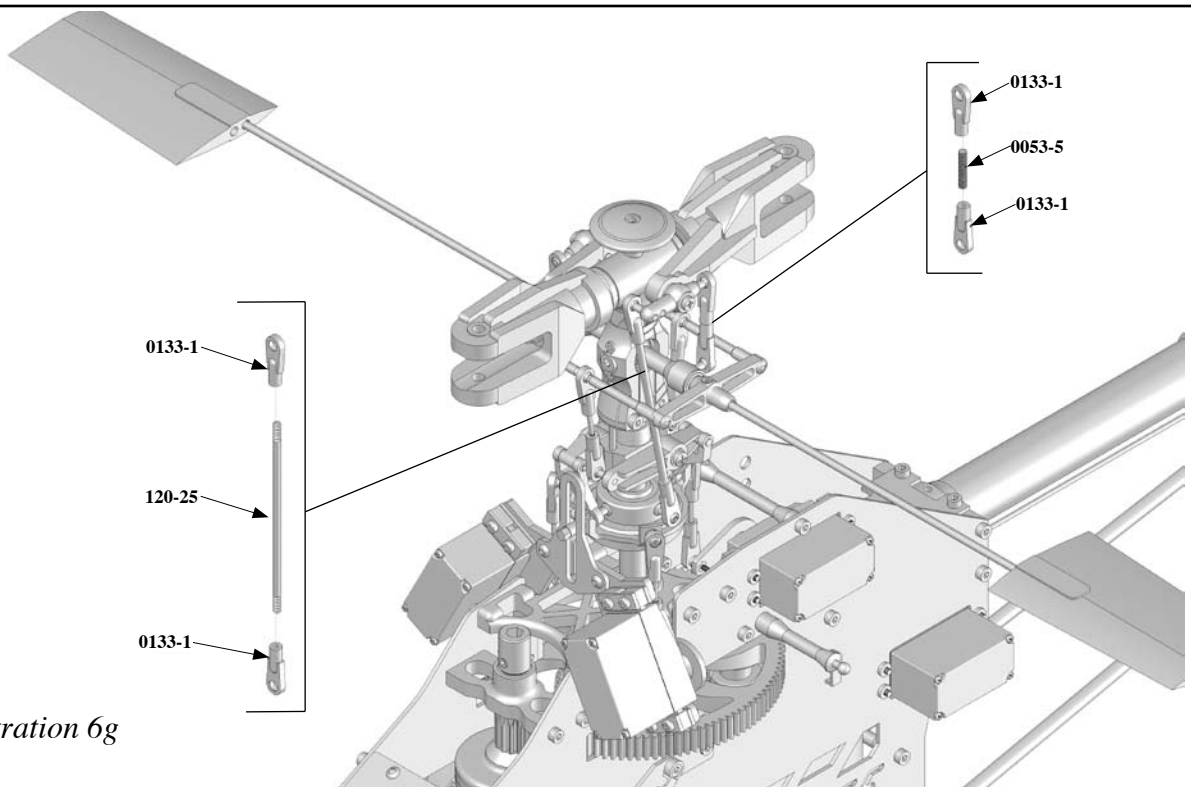


Illustration 6g

Locate the two MA120-25 m3x86 threaded control rod, two MA0053-5 m3x16 socket set screws (these will be used as a threaded control rod), and four MA0133-1 plastic grey ball links. Refer to *Illustration 6g* for this step. Use the MA120-25 m3x86 threaded control rods, and MA0331-1 plastic grey ball links to make two "Hiller" control rods. These control rods should be made so that 70mm of thread control rod is visible between the ball links. See page 44 for control rod lengths. Use the MA0053-5 m3x16 socket set screws, and MA0133-1 plastic grey ball links to make two "Bell" control rods. These control rods should be made so that 0.0mm of thread control rod is visible between the ball links. See page 44 for control rod lengths. Install the completed control linkages as shown in the illustration.

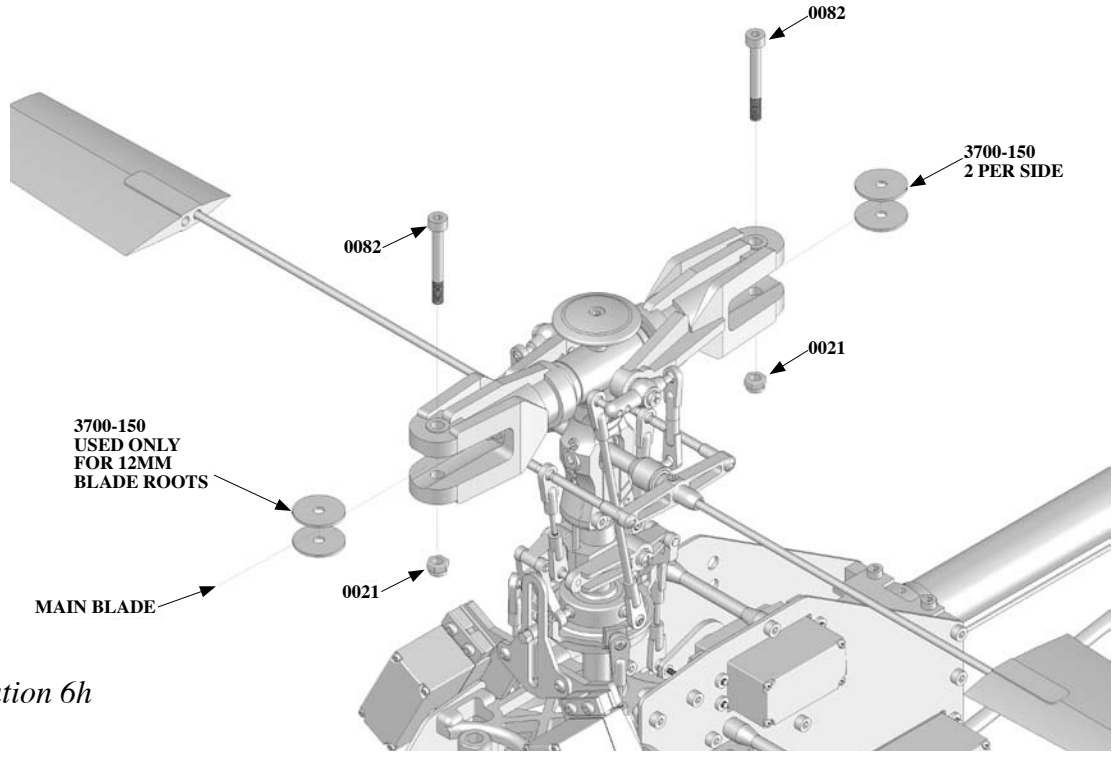
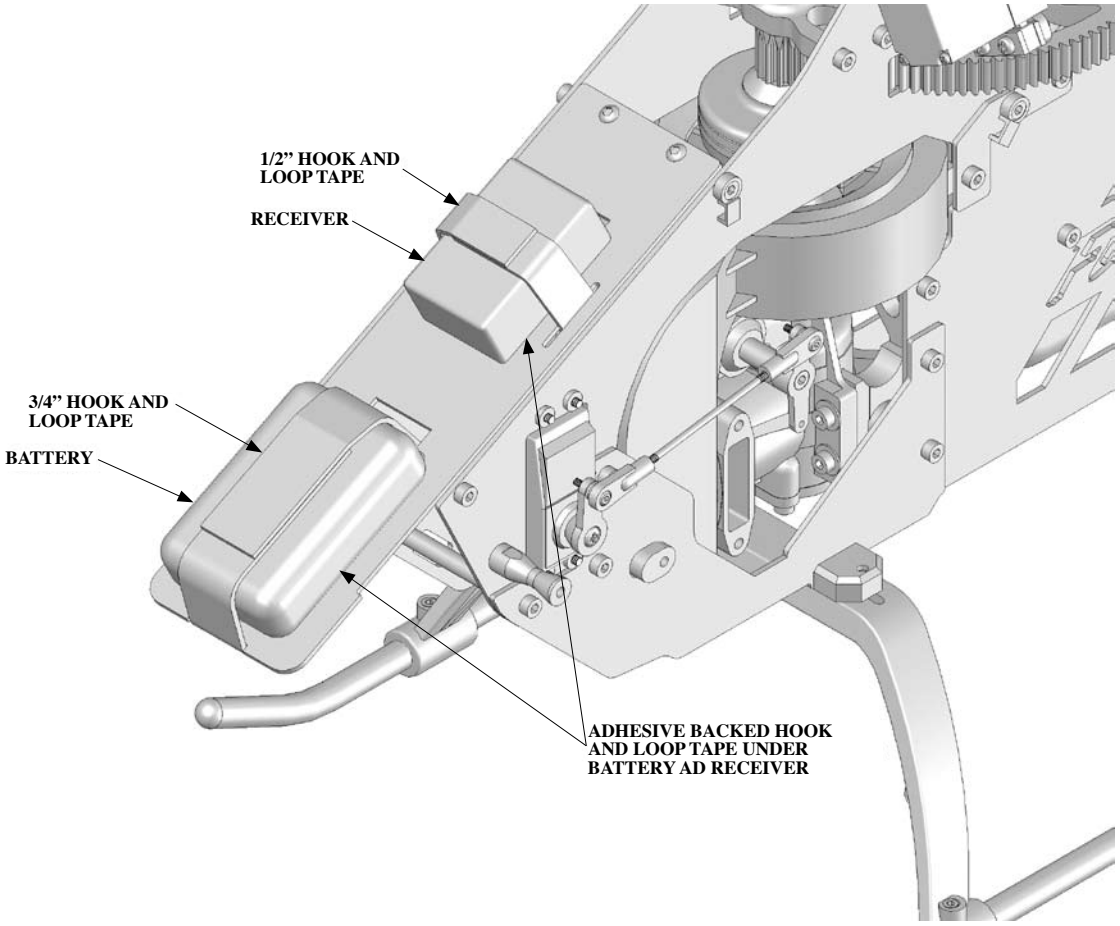
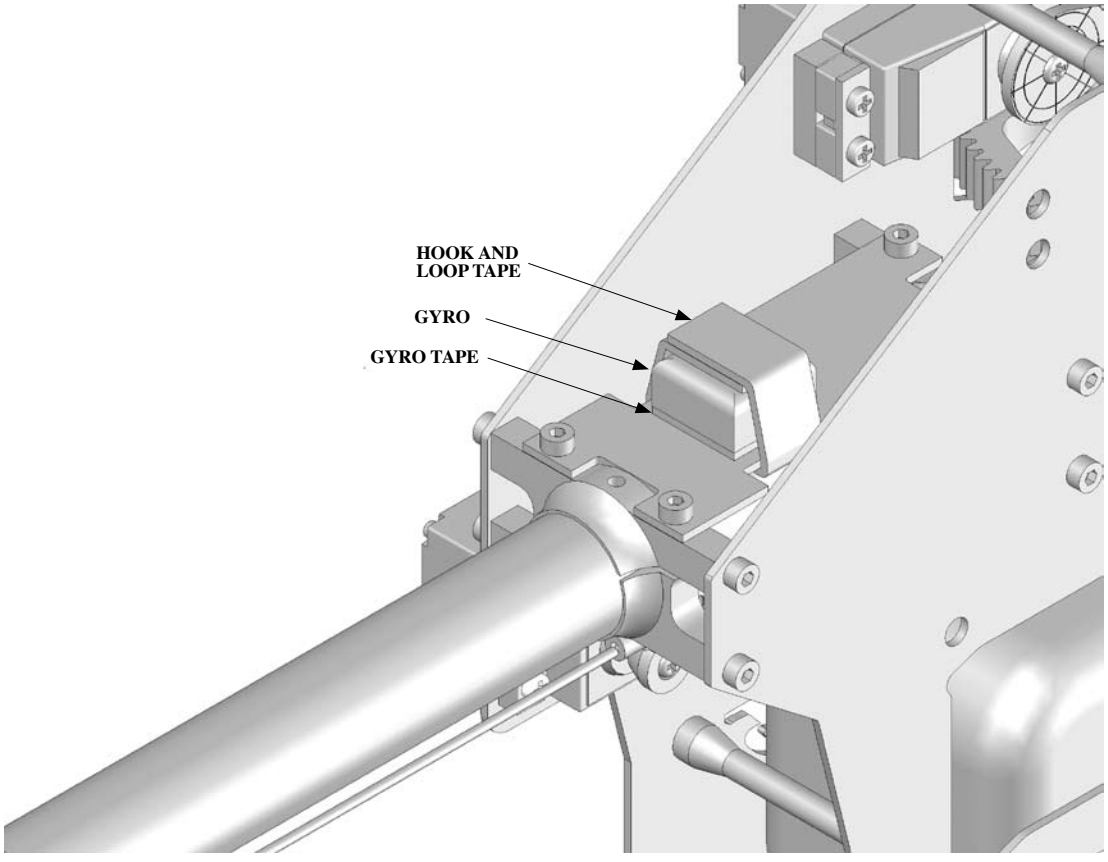


Illustration 6h

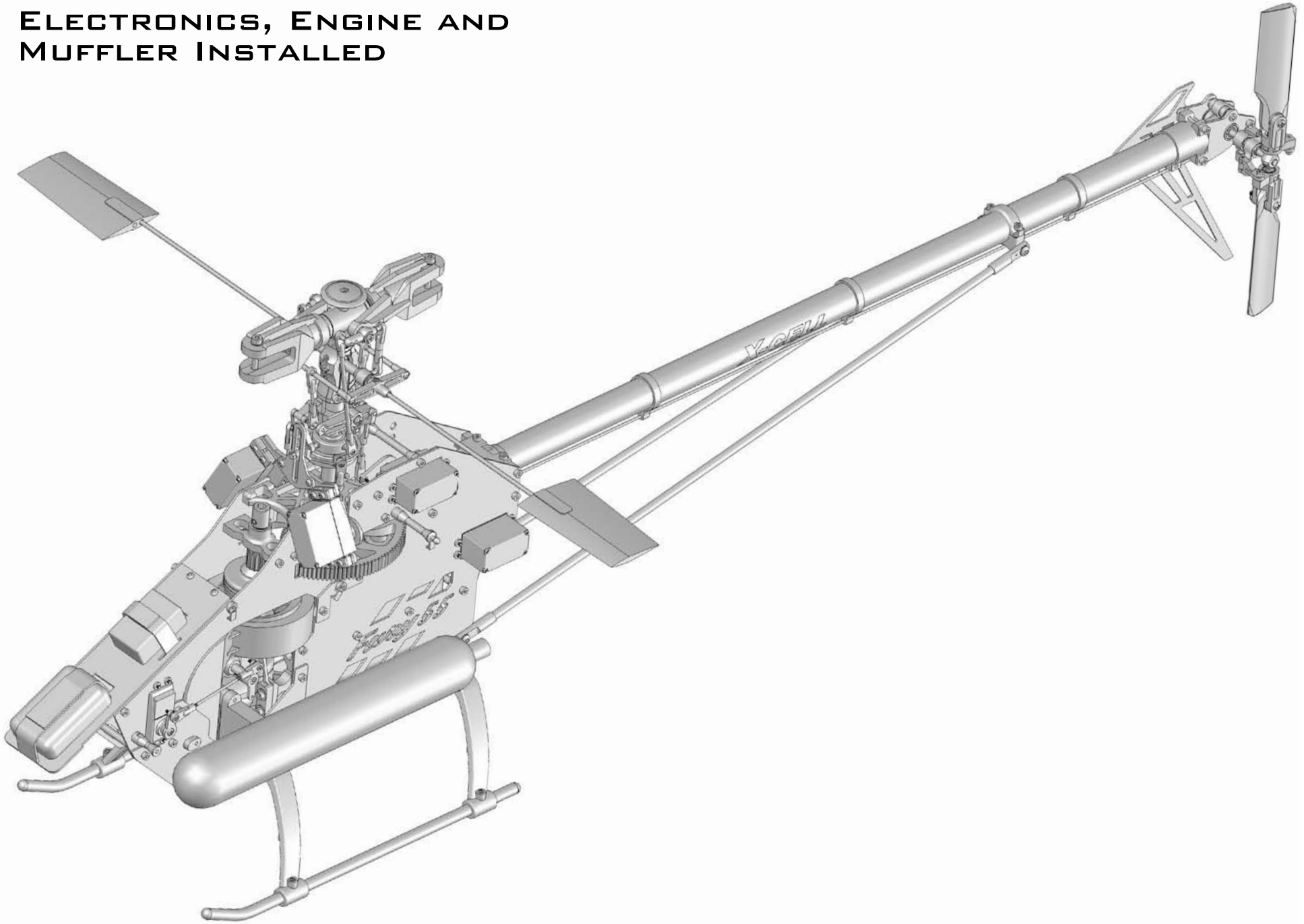
Locate two MA0082 m4x38 socket bolts, two MA0021 m4 locknuts, four MA3700-150 1mm main rotor blade mount spacers, and the rotor blades you intend to use for this model. Refer to *Illustration 6h* for this step. NOTE: The main rotor blade grips on the Fury 55 have a 14mm grip spacing. Some rotor blades have a 12mm root thickness. If this is the case with your rotor blades, please use the MA3700-150 1mm main rotor blade mount spacers above and below each rotor blade root. If your rotor blades have a 14mm root thickness, do not use the spacers. Install the MA0082 m4x38 socket bolt through the hole in the blade grip, and through the rotor blades, and attach the MA0021 m4 locknut on the bottom. Main rotor grip tightness should be so that the blades do not "fall under their own weight", but can still be rotated in the mount with moderate force.

Electronics Installation

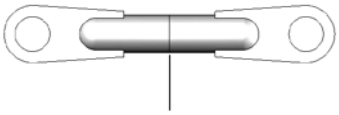

1/2" HOOK AND LOOP TAPE
RECEIVER
3/4" HOOK AND LOOP TAPE
BATTERY
ADHESIVE BACKED HOOK AND LOOP TAPE UNDER BATTERY AD RECEIVER



Completed Airframe with Electronics, Engine and Muffler Installed

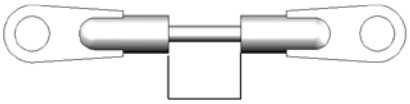


Control Rod Lengths



0.0 mm

Bell Mixer to Flybar

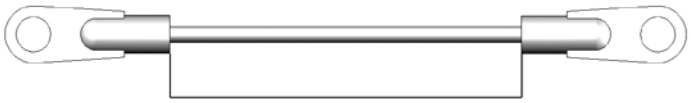


9.25 mm

Servo to Swashplate

13.75 mm

Washout to Flybar



45.0 mm

“Throttle” Servo to Carburetor

approximate length

70.0 mm

“Hiller” Swashplate to Bell Mixer

Basic Model/Radio set up

The X-Cell Fury 55 is an eCCPM model. This means that the servos that are connected to the swashplate move together to achieve the function requested from the transmitter input. The transmitter mixes the channels required to achieve the correct movement of the swashplate. The X-Cell Fury 55 uses a very simple "direct" servo to swashplate system that decreases the overall parts count and complexity of the model.

The very first thing to do, is center the swashplate servos. Your kit includes a simple pointer tool designed to help you center your servos. Ideally, you rotate the servo horn until the servo is centered, eliminating the use of sub-trim.

For the pitch, aileron, and elevator servos:

In your radio

- ATV (servo endpoints) should be at 100%.
- Set all trims and sub-trims to center or zero.
- Set an initial linear pitch curve as a straight line (sample points: 0%, 25%, 50%, 75%, and 100%).
- Make sure there is no mixing enabled for cyclic channels at this point.
- Center the collective stick and make sure all the cyclic channels are centered.

On your model

- Mount each ball into a servo arm hole approximately 19-20mm from the center of each arm.
- Slide the servo horns for each channel onto each servo exactly in the middle of its travel.
- Failing to get them set at center will create interaction in your swash plate travel.
- If possible, center the horns on the servos without using any sub trim. As a last resort, use the sub trim function to precisely center each servo.
- Make sure you install hex nuts on the ball retainer bolts using thread locking compound.
- Make sure you install servo arm retainer screws.

For the rudder servo:

In your radio

- Make sure the gyro is in non-heading hold mode. Refer to your gyro manufacturer as to how to enable this.
- Rudder servo endpoints (ATV) should be at 100%.
- Make sure there is no mixing enabled for rudder channel at this point (some radios mix throttle to rudder by default).

On your model

- The ball should go into a hole approx 13-15mm from the center of the servo wheel.
- With your rudder stick centered, rotate the servo wheel until you find a spot that aligns properly and then slide the servo wheel onto the servo exactly in the middle of its travel. Do not use any sub-trim.
- Now make sure that the T/R bell crank is aligned. The 90 degree pitch slider on the tail case should be in the center of its travel. Adjust the links as necessary to ensure this is correct.
- Make sure you install hex nuts on the ball retainer bolts using thread lock.
- Make sure you install servo arm retainer screws.
- Set up the gyro according to the manufacturers specification in the manual included with the gyro.

Swashplate eCCPM Set Up:

Now that you've built your new Fury 55 helicopter, you have to make the servos work together. The Fury 55 is an eCCPM model, and requires a specific radio program for the servos that control the swashplate. eCCPM is a mix that is already programmed in your transmitter, you just have to fine tune it to your Fury 55 and here's how:

The very first thing you need to do is tell your radio that a 120 degree eCCPM mix must be used. All modern transmitters should have 120 degree eCCPM built programmed from the factory. Consult the manual that came with your radio! Before you turn on your Transmitter and power up your servos, you need to make sure they are centered. Make sure you use the MA128-36 C/F servo alignment tool! With your transmitter and receiver powered on, put collective stick in the exact center with all three swashplate servo horns removed. Then put the horns on so they are 90 degrees to the linkage. This centers the servo horn on the servo and assures that there will be equal travel on either side of the servo's center point. If you find that you cannot get the servo horn exactly at center, you have two choices. You can flip the horn 180 degrees, sometimes the splines will line up perfect, this is the preferred method. You can also use a bit of "sub-trim" to center the servo. You really want to avoid using subtrim because it makes leveling the swashplate a little more involved.

Now you need to make sure that your servos are all working together. What we mean is the three collective servos need to be plugged into the appropriate channels, i.e. the elevator (which is the servo that controls the center ball on the swash) needs to be plugged in to channel 3, the aileron and pitch servo (the ones that control the sides of the swashplate) need to be plugged into channels 2 and 6 (it doesn't matter which channel just either servo, into either 2 or 6 on the RX).

IF you use a Futaba or Hitec transmitter, the channel assignments are a little different. For Futaba, Elevator is channel 2, Aileron is Channel 1, and Pitch is Channel is 6.

Then, using the servo reverse screen, you need to make sure that the servos are doing the proper function. All the servos need to move up (or down) when the collective stick is moved up or down (it doesn't matter if the collective is reversed, we'll fix that later). If it doesn't, you need to (one at a time) reverse the channels on the servo reverse screen until all the servos move in the same direction when the collective stick is moved.

Now the aileron and elevator functions need to be sorted out. When you move the right stick right and left, the swashplate should tilt to the right and left (it doesn't matter if it moves right when you push the stick left, we'll fix that later). Also, when you move the right stick forwards and aft, the elevator should tilt forward or back. (again, it doesn't matter if the FUNCTION is reversed)

Now that the SERVOS are all moving in together, we need to be sure that the SWASHPLATE is moving correctly for a given command. Pull up the Swash Mix screen. Futaba calls it "Swash AFR" There should be 3 functions and they'll look like this:

Aileron: 60%
Elevator: 60%
Pitch: 60%

So, if the the swashplate tilts left when you move the cyclic (right) stick TO the right, make the value of 60% for Aileron NEGATIVE or -60%, and likewise for the elevator, so if the swash tilts forward when you pull the cyclic stick BACK, make the value of 60% NEGATIVE or -60% to correct it.

The swashplate should move up and down with the collective stick, and if you RAISE the collective stick, the blades should show POSITIVE PITCH. And if you LOWER the collective stick, the blades should show NEGATIVE pitch. IF that function is reversed, again, make the value of 60%, NEGATIVE 60% or -60%.

To ensure that your Fury 55 is set up as precise as possible it is very important that you follow the pitch curve set up guide, and you properly level the swashplate. There are several different tools for determining if your swashplate is level. We recommend the MA3000-10 Swashplate Leveling Tool.

Place the swashplate leveler on the swashplate and ensure that it is level. The collective stick should be at the center with zero degrees pitch on the blades. At this same time as described in the pitch curve set up guide, the swashplate should then be in the center of its travel, and the midpoint of the pitch curve should read 50%. If the swashplate is not level, you can use subtrim to level it, but the preferred method would be adjusting the linkages that connect the swashplate to the servos! If you find that you have to use more than a couple of clicks of subtrim on any channel, you should put it back to zero, and adjust mechanically by adjusting the linkages to the swashplate. After the swashplate is perfectly level at center stick, you need to level it at the extreme pitch range, i.e. full positive pitch and full negative pitch.

Place the Collective stick at full positive stick with the swash leveling tool attached. If the swashplate is not level, you will use the End Point screen or Travel Adjust screen. For instance, if the swashplate tilts slightly to the right at full positive pitch, then you will need to increase the travel for the servo that controls that swashplate ball. Now put the collective stick at full negative, repeat the same procedure with the end points. You do have to be careful that you don't create any binding at the extremes of the swashplate's travel.

Pitch Curve Set Up:

It is important that you build your model to exactly the way described in this manual. Make sure all your linkage rods are exactly the length determined in the manual included with your helicopter kit.

First, go to the pitch curve menu in your radio for Idle up 1, or Stunt mode 1. You'll see numbers, a graph or both. There will generally be 5 points you can adjust. You'll have to imagine the points (1,2,3,4,5) as representing points on the collective stick, where point 1 represents full bottom stick, and 5 represents full top stick. Obviously that makes point 3 center stick and that's where we start.

Ensure that point 3 on the pitch curve (center stick) to equal 50% of the swashplate's up and down travel, meaning the in the middle of it's available travel. So, turn on your transmitter, and receiver, flip the flight mode switch to idle-up 1 or Stunt mode, and scroll to the pitch curve menu. Now place the left stick in the center.

Use a pitch gauge, (We recommend MA3000-06) ensure that there is 0 degrees pitch on both rotor blades and that the mixing arms, and washout arms are perpendicular to the mainshaft. If any of this is untrue, you'll need to make it so, by adjusting slightly the length of the pushrods.

Now that you've got 0 degrees at center stick, and point 3 on the pitch curve has a value of 50% (don't deviate here!) We can adjust the pitch at full top and bottom collective stick positions. Generally we want to have the same amount of pitch on the bottom stick position as we do on the top stick position in idle up or stunt mode. That means positive 10 degrees on top stick, and negative 10 degrees on bottom stick. (some pilots are now using more pitch 12, 13 or even 14 degrees, but most people find 10 degrees a perfect place to learn 3D flying).

With the transmitter still in idle up, or stunt mode place the collective stick at the top of it's travel, and take a reading of the pitch gauge and remember that number. It should be a positive pitch value and 10 degrees is a good place to start. Now place the collective stick at the full bottom of it's travel. It should be a negative pitch value and again -10 degrees is a good place to start. If the value is not close to 10 degrees then making it so is a simple adjustment of the swash mix function in your transmitter. In this menu, "swash mix" or "swash AFR", there are three options. Elevator, Aileron, and Pitch. Adjusting the pitch value, adjusts the total up and down travel of the swashplate. Making the number higher gives you a greater pitch range, and making the number lower gives you a smaller pitch range.

If you find that at full top stick, you get a negative pitch value, and at bottom stick you get a positive pitch value, you would go back to that "swash mix" menu, and make the value the opposite, Meaning if it was 60%, make the number –60%. That will change the direction of the swash travel.

Now, You'll notice that your pitch "curve" isn't really a curve at all, it's a straight line. You can adjust this if you wish by changing points 2 and 4. Right now, point 2 is 25%, and point 4 is 75%. You can change those values and it will affect how "jumpy" or responsive the collective is. Usually leaving it a straight line is best until you really get the "feel" for 3D flying.

If you're a beginner chances are you'll want to fly your model around in "normal" mode. Normal mode means that at full bottom stick the engine is at idle and the blades are not turning. You also don't have any need for there to be negative 10 degrees of pitch, usually more like -4 or -5 degrees is best.

This can easily be achieved by raising points 1 and 2. Scroll in the transmitter menu to pitch curve for normal mode, and increase point 1 from 0% to about 35%, and then you can usually inhibit point 2, so it makes a straight line from point 1 to point 3, which should still be 50%.

The Pitch Curve for throttle should usually look real similar to stunt mode. Throttle hold is generally used for performing autorotations.

Throttle Curve Set Up:

Build the throttle linkage as shown previously. This linkage length may change but ideally, you'll want the servo linkage 90 degrees to the servo horn. This ensures equal travel in both directions.

Turn on your transmitter. Scroll to the "throttle curve" screen and notice that there are points, usually 5, and the all have an assignable percentage. For example point 1 is 0% and point 5 is 100% (of the servo's travel). Ensure that when the throttle/collective stick is at the mid point (point 3) that the engine's carburetor is exactly ½ or 50% open (or otherwise stated in the manual included with the engine). This is crucial to easy set up. You may have to loosen the throttle arm on the carburetor for this to happen. Place the throttle stick to ½ and see where the carburetor opens to. On most popular engines today there is a mark that shows the halfway point. If it is not quite ½ way open you can use sub trim to make it so, but you don't want to use too much. Too much sub trim can make further set up more difficult.

Move the throttle stick to full throttle . The servo should open the carb to full open. If it opens less you can increase the end point in your radio so that it opens a little further, and if the servo binds (keeps wanting to move but the throttle is fully open) you can decrease the endpoint, but ideally you want the endpoints as close to 100% and 100% as possible.

If you are experiencing the need for more servo movement, try moving the ball link out one hole on the servo arm, and conversely if you need much less servo movement, you can move the ball link one hole in.

Once you have this set up in normal mode you'll have to start and fly the helicopter to determine whether you need more or less throttle, but from what we've found this is a good starting point.

Setting up for Idle up or stunt mode is a little different, as you'll want full throttle on either end of the collective/throttle stick travel. Scroll to the idle up menu in your radio, and you'll again find points such as 1,2,3,4,5. If you do not have a governor you have to set up a fixed throttle curve that controls the throttle. If you have a governor, please follow the set up instructions from the manufacturer of the governor. Without a governor you'll rely on the throttle curve to control the engine rpm while you're managing the collective stick. Make points 1 and 5 100%. Make point 3 50% Then you'll want a friend with an optical tachometer (we recommend MA3000-50 Optical Heli Tachometer) to observe the head speed of your helicopter. Make sure to follow the rotor speed recommendations given by the manufacturer of the rotor blades you are using. If the head speed is too low, then increase the value of point 3 by 5% increments until you gets the head speed you desire.

Fury 55 Kit Hardware

MA0001	M2 Washer
MA0003	M3 Washer-large
MA0007	6mm Washer
MA0011-4	M5 x 15 x 0.8 Washer
MA0012-1	M2.5 PEM Nut
MA0012-2	M3 PEM Nut
MA0014F	Fine Thread M5 Hex Nut
MA0015	M2 Hex Nut
MA0016-1	M4 External Serrated Lock Washer
MA0017	M3 Hex Nut
MA0019	M3 Locknut
MA0021	M4 Locknut
MA0029	M2.2 x 13 Phillips Self Tapping Screw
MA0038	M2.5 x 10 Phillips Bolt
MA0039-2	M2.5 x 16 Phillips Bolt
MA0049-3	M2 x 8 Socket Bolt
MA0051	M3 x 3 Socket Set Screw
MA0053	M3 x 5 Socket Set Screw
MA0056	M3 x 5 Dog-point Socket Set Screw
MA0057	M4 x 4 Socket Set Screw
MA0058-1	M4 x 6 Socket Bolt
MA0058-3	M4 x 16 Socket Set Screw
MA0058-5	M5 x 8 Dog-point Socket Set Screw
MA0058-6	M5 x 5 Socket Set Screw
MA0059-1	M2.5 x 6 Socket Bolt
MA0060-1	M3 x 6 Socket Bolt
MA0061	M3 x 8 Socket Bolt
MA0062-2	M3 x 12 Tapered Socket Head Bolt
MA0063	M3 x 10 Socket Bolt
MA0064-3	M3 x 6 Button Head Socket Bolt
MA0064-9	M4 x 10 Button Head Socket Bolt
MA0065	M3 x 12 Button Head Socket Bolt
MA0067	M3 x 14 Socket Bolt
MA0078-5	M4 x 10 Socket Bolt
MA0082	M3 x 38 Socket Bolt
MA0086	M5 x 12 Flanged Socket Bolt
MA0091	M3 x 16 Phillips Bolt
MA0095	M3 x 19 Phillips Bolt
MA0097	M3 x 22 Phillips Bolt
MA0447-1	M1.5 E-clip

Fury 55 Kit Parts

MA0103	M2 x 5 Threaded Control Ball
MA0107	M3 x 6 Threaded Control Ball
MA0109	M3 x 8 Threaded Control Ball
MA0112	M3 x 9.4 Threaded Control Ball
MA0133	Ball Link for 2mm
MA0133-1	Grey Ball Link for 3mm
MA0159	M3 x 7 x 3 Ball Bearing
MA0183	M10 x 19 x 5 Ball Bearing
MA0208	10mm Torrington Clutch Bearing
MA0214	Upper Swashplate Ring
MA0214-1	Lower Swashplate Ring
MA0216	M20 x 32 x 7 Ball Bearing
MA0217	Swashplate
MA0218	Heim Ball GE-10C
MA0219	Plastic Washout Hub
MA0221	Plastic Washout Arms
MA0225	M2 x 13.6 Dowel Pin
MA0273	M6 x 10 x .011" Steel Shim Washer
MA0279	Clutch Liner
MA0283	M6 x 10 x 3 Flanged Ball Bearing
MA0317	Plastic Main Blade Mount
MA0319	M8 x 16 x 5 Ball Bearing
MA0324	M10.75 x 16 x 1 Washer
MA0331	M8 x 14 x .5 Washer
MA0332	M8 x 14 x 1 Washer
MA0337	M2 x 30 Threaded Control Rod
MA0361	Control Ball
MA0367	M2 x 60 Threaded Control Rod
MA0390	Push-on Wire Retainers
MA0435	Brass Slider
MA0437	Plastic Control Ring
MA0439	M6 x 10 x 2.5 Open Ball Bearing
MA0440	Control Yoke
MA0442	Pivoting Ball Link
MA0443	Push-on Retainer
MA0446-4	.165" x .310" x .003" Stainless Steel Shim
MA0445	Plastic T/R Bellcrank
MA0457	F4-10 Thrust Bearing 3 Pc
MA0597-3	3/16" x .182" Brass Spacer
MA0597-2	Brass Spacer
MA0597-4	Brass Spacer
MA0586-16	Corner Block
MA0840-12	3pc Thrust Bearing – Main Rotor
MA0840-27	Guide Pins
MA0844-6	90D Head Damper "O" Rings
MA0848-2	M8 Retaining Clips
MA0848-9	Clip Application Tool
MA0869	Plastic Washout Link
MA0873-1	Plastic T/R Blade Mount
MA0875-1	Main Shaft Collar
MA105-70	M6 x 15 x 5 Ball Bearing
MA106-02	M3 x 7 x 3 Flanged Ball Bearing
MA106-22	Rubber Grommet – Front Canopy
MA115-65	Fuel Line 16.5"
MA115-94	Rubber Grommet – Rear Canopy
MA120-7	M5 x 5.5 C/F Washer

Fury 55 Kit Parts

MA120-25	M3 x 86 Threaded Control Rod
MA120-39	M5 x 10 x 4 Ball Bearing
MA120-99	Canopy Knob
MA122-28	M3 x .080" Brass Spacer
MA122-65	Steel T/R Hub
MA127-15	13T T/R Pulley
MA127-16	T/R Output Shaft
MA127-53	Plastic Strut
MA127-54A	Skid Plugs
MA128-10	C/F Right Main Frame
MA128-13	C/F Left Main Frame
MA128-16	G-10 Antirotation Guide
MA128-17	C/F Left Servo Mount
MA128-18	C/F Right Servo Mount
MA128-19	C/F Gyro Plate
MA128-22	C/F Rear Fan Shroud Mount
MA128-25	C/F Fan Shroud Plate
MA128-28	C/F Left Front Frame Plate
MA128-34	Radio Plate
MA128-40	Lower Main Shaft Bearing Block w/Bearing
MA128-43	Main Shaft
MA128-46	60T T/R Drive Pulley
MA128-47	600T T/R Drive Belt
MA128-48	Brass Bushing
MA128-49	Autorotation Hub
MA128-52	111T Main Gear
MA128-55	Upper Main Shaft Bearing Block w/Bearing
MA128-57	Aluminum Tray Mount
MA128-58	Frame Spacers
MA128-59	Front Boom Support Spacer
MA128-61	Rear Canopy Mount
MA128-62	Front Canopy Mount
MA128-65	Landing Gear Mounting Block
MA128-66	Aluminum Skids
MA128-67	Pulley Mount
MA128-70	Aluminum Idler Pulley w/Bearing
MA128-71	M3 x 9 x 4 Ball Bearing
MA128-80	Aluminum Boom Clamp
MA128-82	Motor Mount
MA128-83	Motor Mount Base
MA128-85	C/F Tank Mounting Plate
MA128-88	Rubber Fuel Tank Mount
MA128-90	Tank Plate Threaded Stud Mount
MA128-92	Rubber Fuel Tank Plug
MA128-94	Fuel Nipple
MA128-96	Fuel Clunk
MA128-99	Fuel Tank
MA128-102	Aluminum Fan Hub
MA128-104	Aluminum Fan
MA128-106	Centrifugal Clutch
MA128-107	Start Shaft
MA128-108	Start Shaft Sleeve
MA128-109	Start Shaft Assembly
MA128-110	Clutch Bell Unit
MA128-111	Clutch Bell
MA128-113	Pinion Gear
MA128-118	6mm Hex Starting Adaptor
MA128-120	Clutch Drive Bearing Block w/Bearings
MA128-121	M6 x 13 x 5 Ball Bearing
MA128-123	Fan Shroud Set
MA128-125	C/F Shroud Deflector
MA128-128	½" x 3/8" x 1/16" Rubber "O" Ring
MA128-140	Aluminum Tail Boom
MA128-142	T/R Control Rod
MA128-144	Plastic Rudder Pushrod Guides
MA128-145	C/F Boom Support Tube
MA128-146	Aluminum Boom Support Ends
MA128-148	Boom Support Assembly
MA128-149	Rear Boom Support Clamp
MA128-155	Aluminum Transmission Clamp
MA128-156	M3 Threaded Bearing Stud
MA128-157	T/R Idler Pulley w/Bearings
MA128-158	Aluminum Bellcrank Mount
MA128-159	T/R Pitch Slider Assembly
MA128-160	M6 x 1 Shim Washer
MA128-161	C/F Left Tail Plate w/Bearing
MA128-162	M5 x 13 x 4 Flanged Ball Bearing
MA128-164	C/F Right Tail Plate w/Bearing
MA128-166	Plastic T/R Blades
MA128-167	C/F Vertical Fin
MA128-170	Plastic Servo Blocks
MA128-172	G-10 Servo Retainers
MA128-173	.090" C/F Cyclic Servo Spacers
MA128-174	Swashplate Guide Pin
MA128-176	M2 x .584" Washout Pivot Pins
MA128-180	Head Block Assembly
MA128-182	Head Block
MA128-186	Flybar Pivot Tube
MA128-187	8mm Head Axle
MA128-188	Main Blade Grip w/MA0319 Bearing
MA128-189	Flybar Control Bar
MA128-190	Flybar Paddle
MA128-192	Flybar Control Arm W/base
MA128-193	M3 x 440 Flybar
MA128-195	Head Button
MA128-196	3D Bell Mixer Assembly
MA128-198	M3 x 16 Dowel Pin
MA128-200	Fury 55 Painted Canopy
MA128-210	Instruction Set
MA130-062	M4 x 9 x 4 Ball Bearing
MA3200-46	½" x 20" Hook and Loop Tape
MA3200-48	¾" x 15" Hook and Loop Tape

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Warranty

The warranty covers defects in material or workmanship or missing components to the original purchaser for 30 days from the date of purchase. Miniature Aircraft, USA will replace or repair, at our discretion, the defective or missing component. Defective components must be returned to us prior to replacement.

Any part, which has been improperly installed, abused, crash damaged or altered by unauthorized agencies, is not covered. Under no circumstances will the buyer be entitled to consequential or incidental damages. The components used in this kit are made from special materials designed for special applications and design strengths. We recommend that all replacement parts be original parts manufactured by Miniature Aircraft, USA, to ensure proper and safe operation of your model. Any part used which was manufactured by any firm other than Miniature Aircraft USA, VOIDS all warranties of this product by Miniature Aircraft USA.

X-Cell FURY 55

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